tide lstm

Lucy Score = Throughput x Availability x Acc / 10,000. LPD condenses live-fit vs Acc-champ RAM.
[T]=Tween [S]=Split [FP]=FastProxy [L]=Linear [HP]=HeadProxy
done - epoch 1/1 (1 left, 100% overall) - lr unset - 2026-08-23 13:32:55 -
This epoch 2346 / 2346 cells. Recorded 2346 results. Learning rate unset.
Score 0 usually means the cell finished before a Lucy pulse (Acc never sampled). Score is live-fit: Throughput x Availability x Acc.
SGD that blocks serve dies on Availability. SoftAcc is serve-confidence only.
pi_collection - lstm - offline report

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	uint5|none|[T][S][HP]|single|simd	7.23	25.1	50.0	115.2	25.0
throughput	float32|none|sgd|single|simd	27.94	25.0	23.1	499.0	22.4
availability	nf4|none|[T][S]Sparse|tricameral|simd	4.10	25.0	25.0	40.8	40.1
lucy score	int8|none|sgd|single|simd	28.28	25.0	26.7	496.6	22.8
mobile score (trap)	binary|none|sgd|single|simd	22.95	24.3	18.0	461.1	20.5
t->50%	int6|none|sgd|bicameral|simd	0.88	7.5	6.2	47.0	25.0
acc/sec	int2|none|step_tween|tricameral|simd	4.81	25.0	26.9	154.9	12.4

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	[T][S][L]	uint3	tricameralx3	100.00
throughput	sgd	float32	singlex1	499.05
availability	[T][S]Sparse	nf4	tricameralx3	40.13
score	sgd	int8	singlex1	28.28
soft_acc	[T][S][HP]	uint5	singlex1	25.09
acc_thru	sgd	int2	singlex1	168.03
realtime	sgd	int8	singlex1	113.10
adapt	[T][S]	int2	singlex1	25.14
keep_learn	tween_chain	fp6	tricameralx3	16.41
acc_per_sec	step_tween	int2	tricameralx3	12.41
time_to_50	sgd	int6	bicameralx2	0.06
consistency	sgd	float32	singlex1	100.00
stability	tween	fp4	singlex1	100.00
mobile_score	sgd	binary	singlex1	71615.84
lpd	[T][S][HP]Async	uint32	singlex1	1.93
mspeed	[T][S][HP]Async	uint32	singlex1	1.00
mavail	[T][S][FP]	uint	tricameralx3	1.00
mix	[T][S][HP]Async	uint32	singlex1	0.82
gold_std	[T][S][L]	uint3	tricameralx3	6.54

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
sgd	int8	none	28.3	25.0	26.7	22.8	102
[T][S]	int8	none	26.7	25.0	24.1	26.8	102
tween_chain	float32	none	26.5	25.0	25.0	21.4	102
MeshBP	float32	none	25.1	25.0	20.9	22.3	102
Step[T][S]	float32	none	23.2	25.0	18.8	20.8	102
Mesh[T]Chain	float32	none	22.2	25.0	25.2	21.9	102
Mesh[T]	uint8	none	22.0	25.0	30.7	22.2	102
[T][S][HP]	int8	none	21.6	25.0	25.0	25.9	102
tween	ternary	none	19.2	25.0	20.3	18.9	102

step_tween_chain	float32	none	19.1	25.0	28.0	18.5	102
[T][S][FP]	int8	none	18.8	25.0	18.8	25.3	102
step_sgd	float32	none	18.5	23.7	27.6	18.7	102
[T][S]Sparse	int8	none	15.9	25.0	28.1	32.7	102
step_tween	float32	none	15.8	25.0	25.4	17.2	102
[T][S][L]Cache	float32	none	14.8	25.0	6.2	24.5	102
[T][S][HP]Async	float32	none	12.1	25.1	46.9	24.2	102
Mesh[T][S]	float32	none	10.9	25.0	25.0	26.3	102
[T]Alt	float32	none	10.1	25.1	43.8	15.7	102
Mesh[T][S]Sparse	float32	none	10.1	25.0	15.6	32.4	102
[T][S][L]	float32	none	9.4	25.0	12.5	18.0	102
Mesh[T][S][FP]	float32	none	8.8	25.0	15.6	26.3	102
Step[T]Alt	uint8	none	5.3	25.0	12.5	13.4	102
Mesh[T]Alt	int4	none	2.3	25.0	9.4	13.9	102

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
sgd	int8	28.3	25.0	26.7
[T][S]	int8	26.7	25.0	24.1
tween_chain	float32	26.5	25.0	25.0
MeshBP	float32	25.1	25.0	20.9
Step[T][S]	float32	23.2	25.0	18.8
Mesh[T]Chain	float32	22.2	25.0	25.2
Mesh[T]	uint8	22.0	25.0	30.7
[T][S][HP]	int8	21.6	25.0	25.0
tween	ternary	19.2	25.0	20.3
step_tween_chain	float32	19.1	25.0	28.0
[T][S][FP]	int8	18.8	25.0	18.8
step_sgd	float32	18.5	23.7	27.6
[T][S]Sparse	int8	15.9	25.0	28.1
step_tween	float32	15.8	25.0	25.4
[T][S][L]Cache	float32	14.8	25.0	6.2
[T][S][HP]Async	float32	12.1	25.1	46.9
Mesh[T][S]	float32	10.9	25.0	25.0
[T]Alt	float32	10.1	25.1	43.8
Mesh[T][S]Sparse	float32	10.1	25.0	15.6
[T][S][L]	float32	9.4	25.0	12.5
Mesh[T][S][FP]	float32	8.8	25.0	15.6
Step[T]Alt	uint8	5.3	25.0	12.5
Mesh[T]Alt	int4	2.3	25.0	9.4

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
int8	sgd	28.3	25.0	26.7
float32	sgd	27.9	25.0	23.1
int2	sgd	27.1	25.0	34.2
uint8	sgd	25.9	24.4	35.0
float64	sgd	25.4	24.4	21.3
int4	sgd	25.2	24.4	27.6
ternary	tween_chain	25.1	25.0	18.9
bfloat16	tween_chain	24.1	25.0	24.8
binary	sgd	22.9	24.3	18.0

fp4	sgd	22.6	24.4	21.6
fp8e5m2	sgd	21.3	24.4	17.3
uint32	sgd	21.0	25.0	25.9
int32	sgd	20.4	25.0	14.5
int64	sgd	20.3	24.4	24.6
fp8e4m3	sgd	20.1	24.4	24.3
uint16	sgd	19.1	24.4	24.3
complex64	sgd	18.4	25.0	34.8
int16	sgd	18.3	23.8	18.2
uintptr	sgd	18.2	24.4	34.1
float16	sgd	17.9	23.1	22.3
uint4	sgd	17.7	23.8	28.0
uint64	sgd	17.4	23.1	28.4
complex128	sgd	17.2	24.4	20.1
uint	sgd	16.9	23.7	22.4
int	tween_chain	16.7	25.0	22.4
uint2	tween_chain	16.0	25.0	35.4
nf4	sgd	15.5	23.7	26.6
int3	tween_chain	11.0	25.0	22.1
uint3	sgd	11.0	20.5	20.4
int5	tween_chain	10.3	25.0	39.9
uint6	tween_chain	10.0	25.0	25.7
int6	tween_chain	9.5	25.0	25.3
uint5	tween_chain	9.4	25.0	19.2
fp6	tween_chain	8.5	25.0	33.3

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	int8|none|sgd|single|simd	28.3	25.0	26.7	496.6	22.8
2	float32|none|sgd|single|simd	27.9	25.0	23.1	499.0	22.4
3	int2|none|sgd|single|simd	27.1	25.0	34.2	491.8	22.1
4	int8|none|[T][S]|single|simd	26.7	25.0	24.1	398.7	26.8
5	float32|none|tween_chain|single|simd	26.5	25.0	25.0	495.4	21.4
6	uint8|none|sgd|single|simd	25.9	24.4	35.0	456.8	23.3
7	float64|none|sgd|single|simd	25.4	24.4	21.3	431.5	24.1
8	int4|none|sgd|single|simd	25.2	24.4	27.6	484.7	21.3
9	float32|none|MeshBP|single|simd	25.1	25.0	20.9	449.7	22.3
10	ternary|none|tween_chain|single|simd	25.1	25.0	18.9	434.9	23.1
11	bfloat16|none|tween_chain|single|simd	24.1	25.0	24.8	403.2	23.9
12	int8|none|MeshBP|single|simd	23.8	25.0	14.0	441.2	21.6
13	int4|none|tween_chain|single|simd	23.3	25.0	22.3	424.3	22.0
14	float32|none|[T][S]|single|simd	23.3	25.0	29.9	361.1	25.8
15	float32|none|Step[T][S]|single|simd	23.2	25.0	18.8	445.1	20.8
16	binary|none|sgd|single|simd	22.9	24.3	18.0	461.1	20.5
17	fp4|none|sgd|single|simd	22.6	24.4	21.6	412.4	22.5
18	int4|none|[T][S]|single|simd	22.5	25.0	29.7	356.1	25.2
19	int8|none|tween_chain|single|simd	22.3	25.0	20.1	446.7	19.9
20	binary|none|tween_chain|single|simd	22.3	25.0	25.6	382.9	23.3

Leaderboard (SoftAcc)

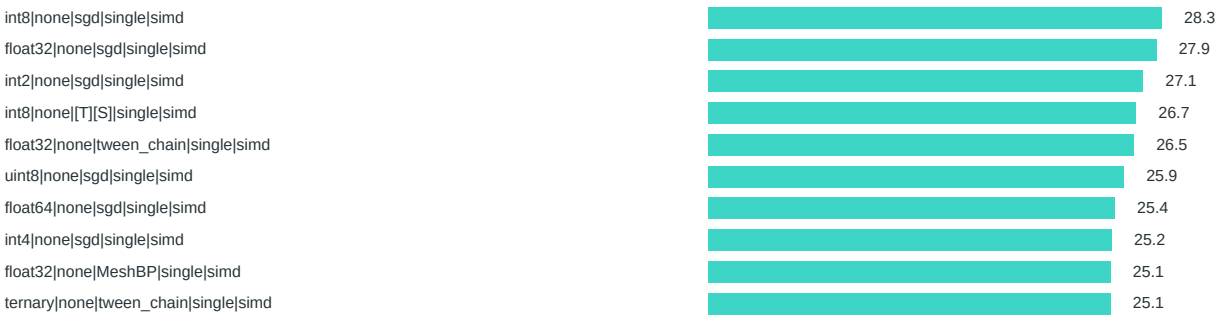
#	Cell	Score	Soft	Acc	Thru	Avail
1	binary|none|Step[T][S]|single|simd	21.9	25.0	37.5	421.5	20.8

2	uint8|none|tween_chain|single|simd	22.2	25.0	24.4	399.5	22.2
3	float64|none|tween_chain|single|simd	19.6	25.0	30.8	360.3	21.8
4	int4|none|[T][S]|single|simd	22.5	25.0	29.7	356.1	25.2
5	ternary|none|tween_chain|single|simd	25.1	25.0	18.9	434.9	23.1
6	int2|none|sgd|single|simd	27.1	25.0	34.2	491.8	22.1
7	int8|none|sgd|single|simd	28.3	25.0	26.7	496.6	22.8
8	uint32|none|sgd|single|simd	21.0	25.0	25.9	341.1	24.6
9	uint8|none|MeshBP|single|simd	21.2	25.0	22.0	378.6	22.4
10	uint8|none|Mesh[T]|single|simd	22.0	25.0	30.7	396.7	22.2
11	float32|none|tween_chain|single|simd	26.5	25.0	25.0	495.4	21.4
12	int4|none|tween_chain|single|simd	23.3	25.0	22.3	424.3	22.0
13	bfloat16|none|tween_chain|single|simd	24.1	25.0	24.8	403.2	23.9
14	fp8e4m3|none|tween_chain|single|simd	19.7	25.0	21.3	322.1	24.4
15	int8|none|[T][S][HP]|single|simd	21.6	25.0	25.0	333.7	25.9
16	float32|none|sgd|single|simd	27.9	25.0	23.1	499.0	22.4
17	int2|none|tween_chain|single|simd	20.3	25.0	19.2	396.3	20.4
18	float32|none|MeshBP|single|simd	25.1	25.0	20.9	449.7	22.3
19	int8|none|[T][S]|single|simd	26.7	25.0	24.1	398.7	26.8
20	float32|none|Step[T][S]|single|simd	23.2	25.0	18.8	445.1	20.8

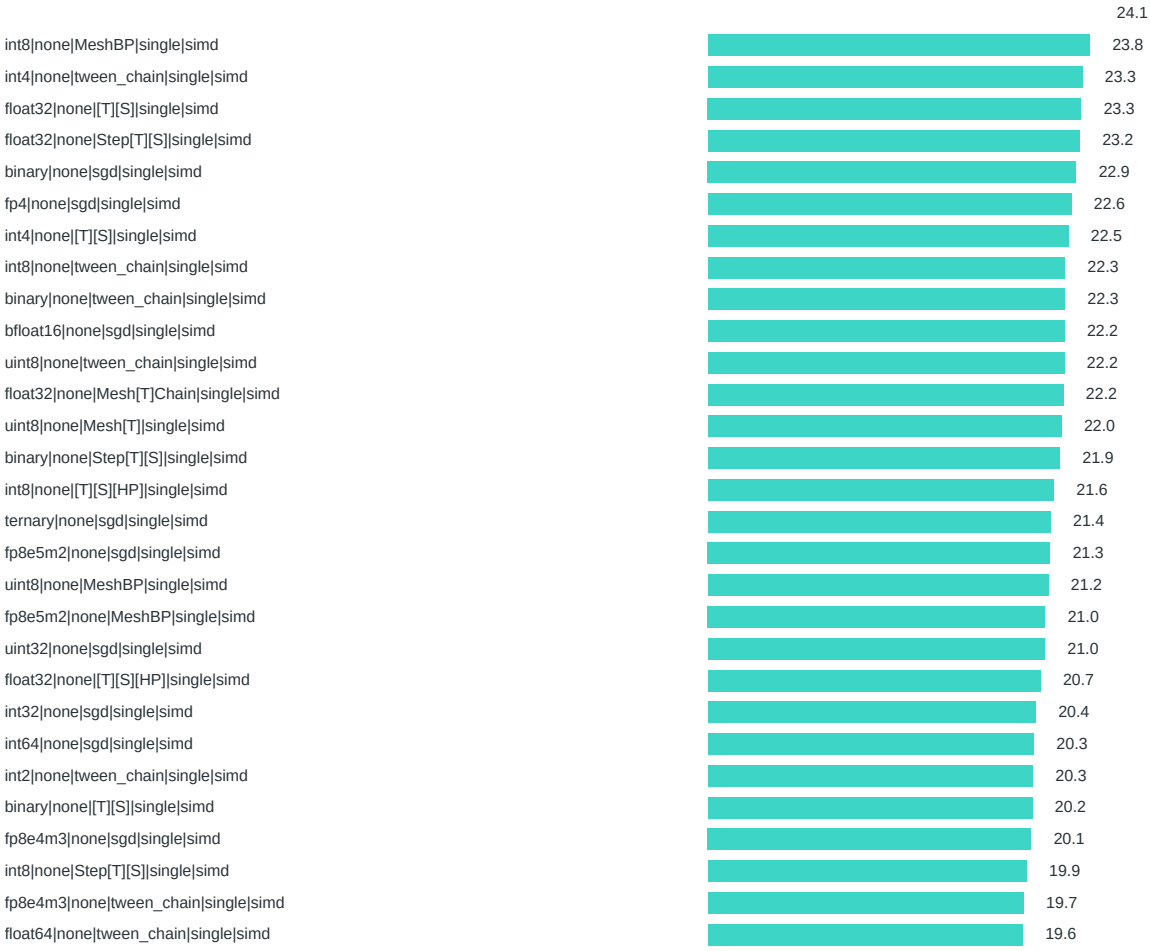
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	binary|none|Step[T][S]|single|simd	21.9	25.0	37.5	421.5	20.8
2	uint8|none|sgd|single|simd	25.9	24.4	35.0	456.8	23.3
3	int2|none|sgd|single|simd	27.1	25.0	34.2	491.8	22.1
4	float64|none|tween_chain|single|simd	19.6	25.0	30.8	360.3	21.8
5	uint8|none|Mesh[T]|single|simd	22.0	25.0	30.7	396.7	22.2
6	float32|none|[T][S]|single|simd	23.3	25.0	29.9	361.1	25.8
7	int4|none|[T][S]|single|simd	22.5	25.0	29.7	356.1	25.2
8	int4|none|sgd|single|simd	25.2	24.4	27.6	484.7	21.3
9	int8|none|sgd|single|simd	28.3	25.0	26.7	496.6	22.8
10	uint32|none|sgd|single|simd	21.0	25.0	25.9	341.1	24.6
11	binary|none|tween_chain|single|simd	22.3	25.0	25.6	382.9	23.3
12	float32|none|Mesh[T]Chain|single|simd	22.2	25.0	25.2	403.9	21.9
13	int8|none|[T][S][HP]|single|simd	21.6	25.0	25.0	333.7	25.9
14	float32|none|tween_chain|single|simd	26.5	25.0	25.0	495.4	21.4
15	bfloat16|none|tween_chain|single|simd	24.1	25.0	24.8	403.2	23.9
16	int64|none|sgd|single|simd	20.3	24.4	24.6	335.5	24.9
17	uint8|none|tween_chain|single|simd	22.2	25.0	24.4	399.5	22.2
18	fp8e4m3|none|sgd|single|simd	20.1	24.4	24.3	344.6	24.0
19	int8|none|[T][S]|single|simd	26.7	25.0	24.1	398.7	26.8
20	bfloat16|none|sgd|single|simd	22.2	24.3	23.9	408.1	22.4

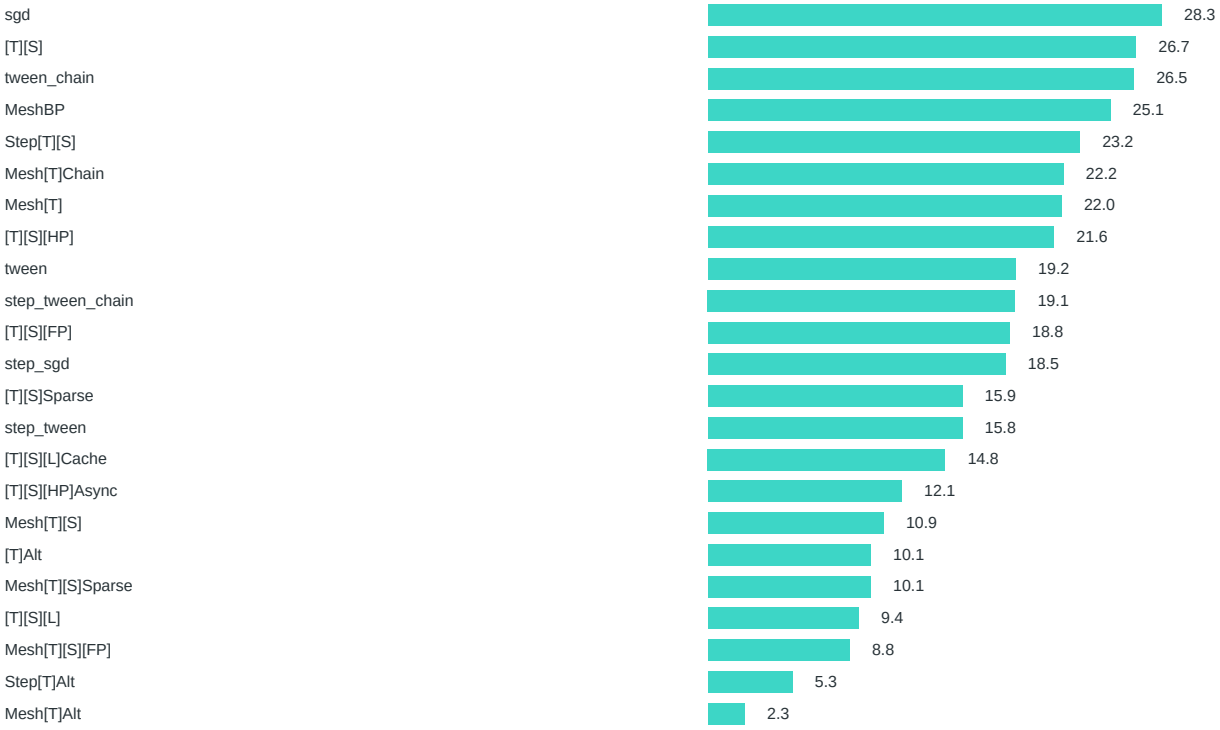
Top scores



bfloat16|none|tween_chain|single|simd

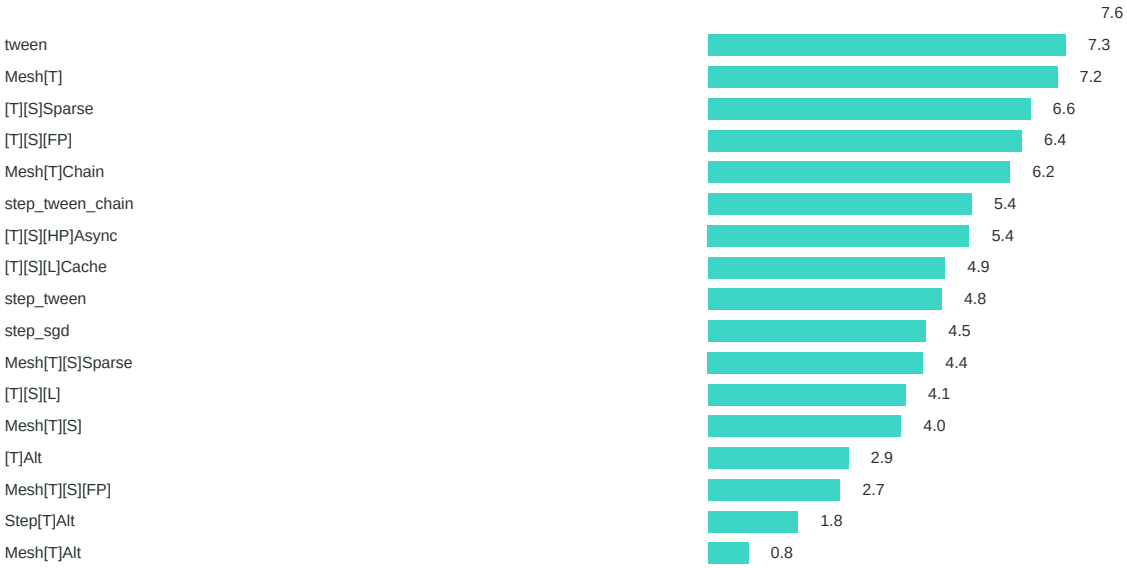


Best settings per mode

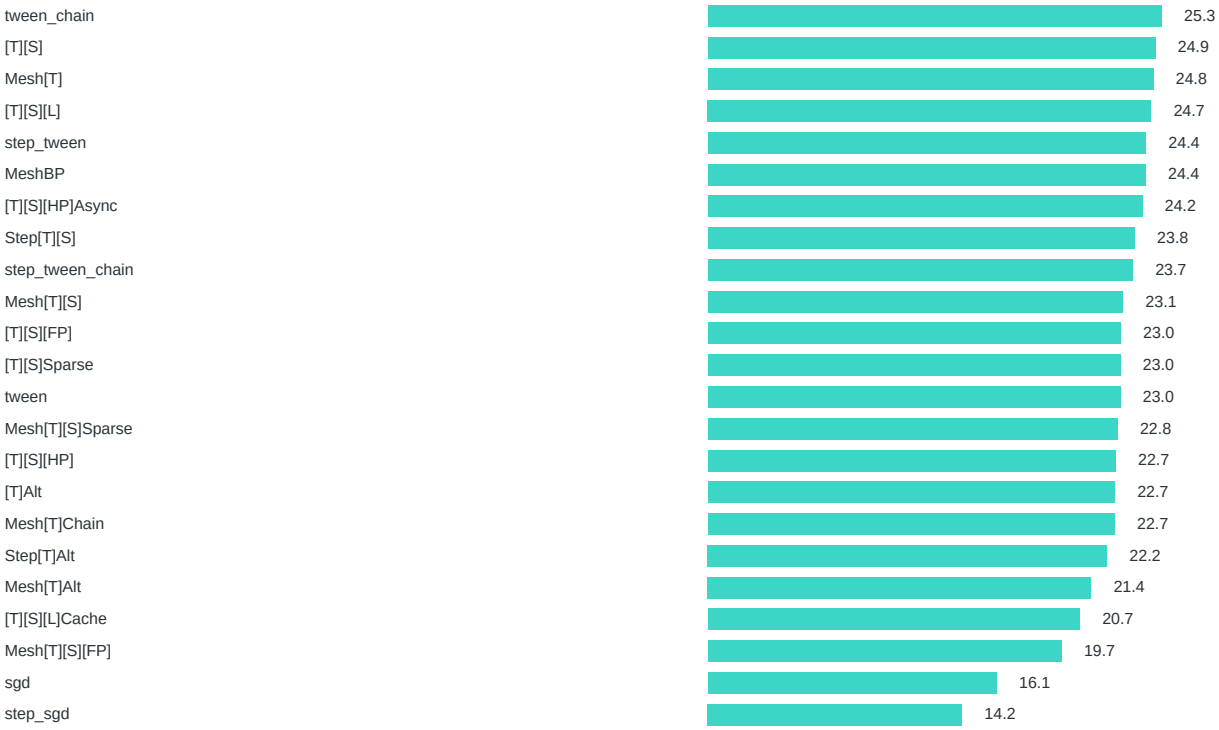


Mean Score by train mode

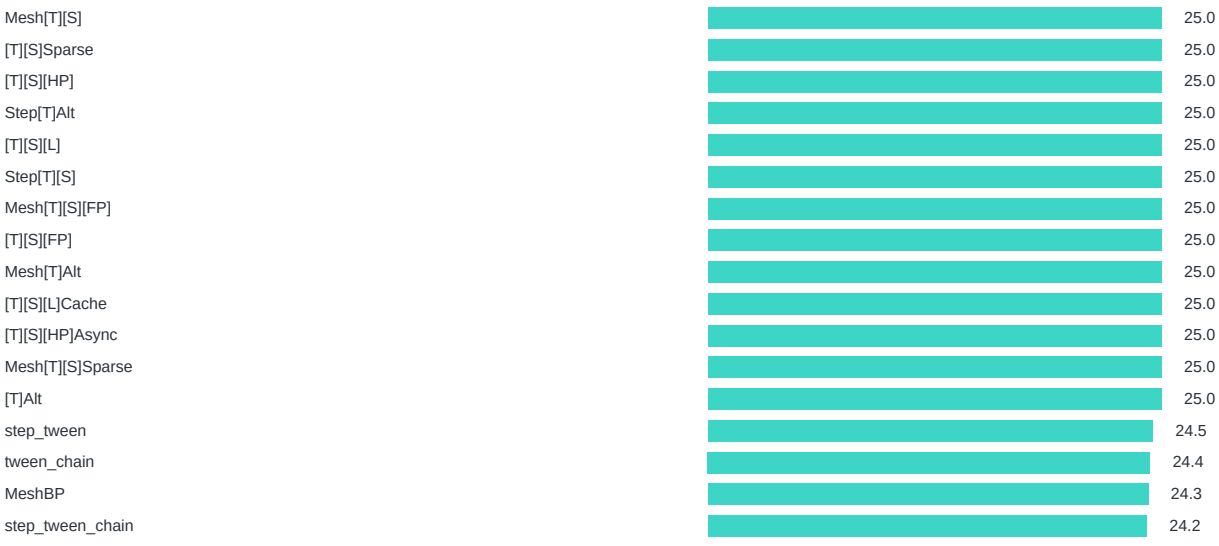




Mean hard Acc by train mode



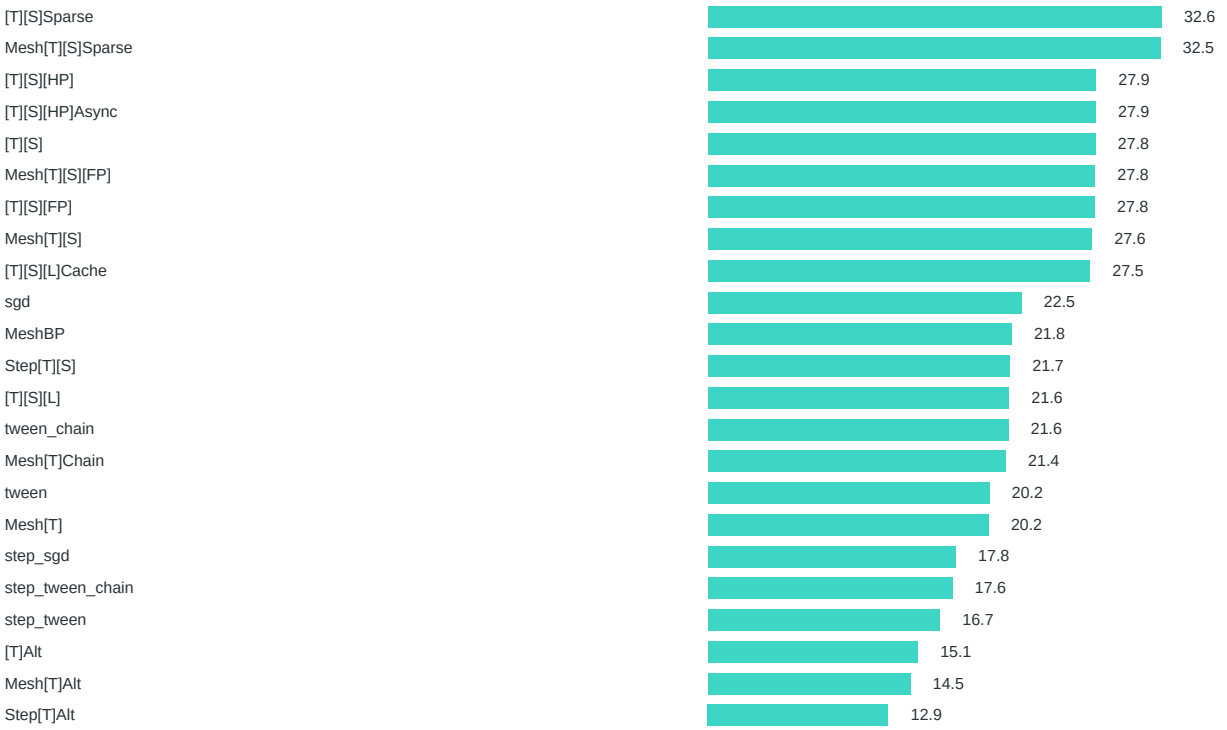
Mean SoftAcc by train mode



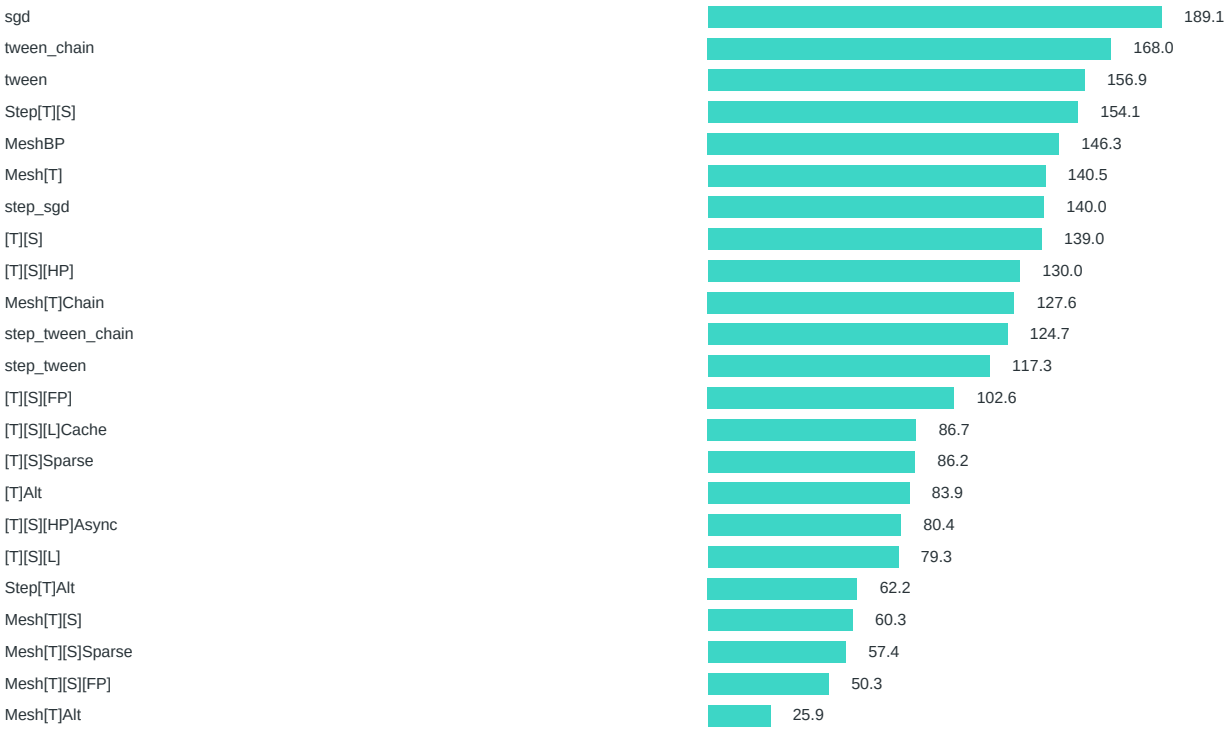
[T][S]



Mean Availability by train mode



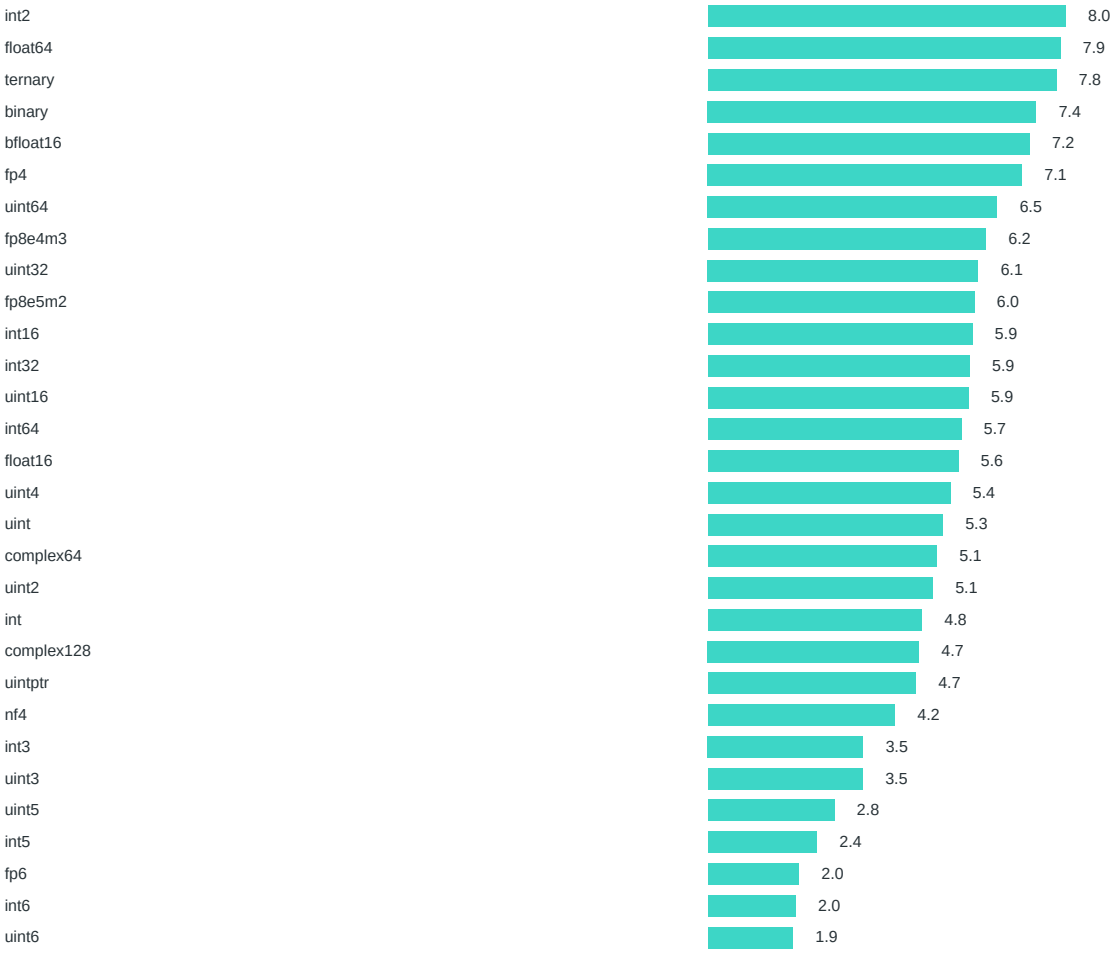
Mean Throughput by train mode



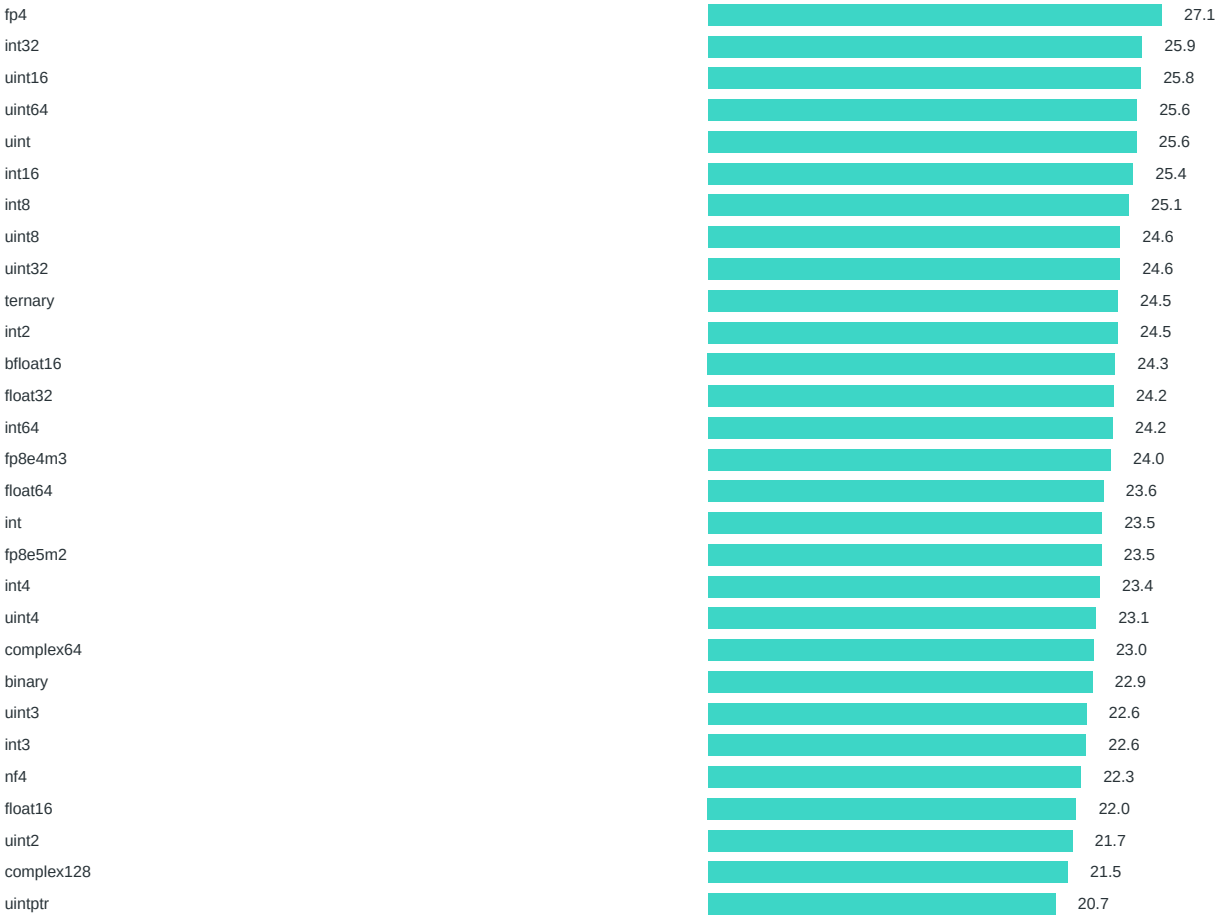
Mean Score by dtype



Mean Score by dtype



Mean hard Acc by dtype



Mean hard Acc by dtype



Mean Score by arch



Honesty - mean Score, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	9	8	8	8	9	12	13	10	4	6	9	7
Mesh[T]	10	9	4	8	8	11	10	10	4	8	8	6
Mesh[T]Alt	1	1	1	1	1	1	1	1	0	1	1	1
Mesh[T]Chain	6	6	6	8	8	10	9	9	4	8	8	5
Mesh[T][S]	6	6	2	4	3	7	8	4	1	6	5	4
Mesh[T][S][FP]	4	3	3	2	5	7	4	4	2	3	2	3
Mesh[T][S]Sparse	5	7	5	4	3	6	6	6	1	4	4	4
Step[T]Alt	2	2	1	1	2	2	3	3	1	2	2	2
Step[T][S]	10	12	5	10	7	13	10	10	1	12	4	7
[T]Alt	1	4	0	2	2	8	5	4	2	2	4	4
[T][S]	9	12	10	6	12	18	12	14	4	8	9	5
[T][S][FP]	10	6	7	3	4	10	10	9	4	6	6	6
[T][S][HP]	13	13	12	7	4	14	9	9	1	9	11	7
[T][S][HP]Async	7	5	7	3	5	13	6	7	1	6	5	5
[T][S][L]	6	3	2	5	3	4	7	6		6	5	6
[T][S][L]Cache	7	6	3	2	5	6	7	4	2	8	4	3
[T][S]Sparse	8	14	3	6	8	14	7	9	0	7	13	8
sgd	12	8	6	10	7	18	11	9	2	10	7	6
step_sgd	5	5	3	3	4	12	6	6	1	5	6	2
step_tween	6	7	4	5	5	9	7	6	2	6	6	4
step_tween_chain	7	9	5	4	6	11	7	6	2	5	5	4
tween	10	10	6	7	7	10	10	8	3	6	7	6
tween_chain	14	11	8	7	11	15	14	10	5	9	9	8

Honesty - mean Score, every mode x dtype (cols 13-24)

Honesty - mean Score, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	6	9	5	8	5	3	3	5	11	4	9	11
Mesh[T]	4	10	4	6	13	3	4	9	11	9	8	6
Mesh[T]Alt	1	1	1	1	0	1	0	2	1	1	0	2
Mesh[T]Chain	6	9	3	6	8	3	3	5	9	4	11	6
Mesh[T][S]	4	7	0	3	5	1	2	4	7	3	4	2
Mesh[T][S][FP]	3	4	2	2	2	2	0	2	2	2	4	2
Mesh[T][S]Sparse	4	11	2	5	12	2	1	3	9	1	6	3
Step[T]Alt	2	5	2	3	2	1	1	1	2	1	2	2
Step[T][S]	12	14	7	7	14	3	2	4	14	9	18	10
[T]Alt	3	3	2	5	2	2	1	3	4	3	6	3
[T][S]	8	12	7	10	16	5	3	10	15	8	11	7
[T][S][FP]	8	6	5	7	10	4	1	6	7	6	4	8
[T][S][HP]	10	14	8	11	15	2	1	12	14	5	11	8
[T][S][HP]Async	6	3	3	3	6	2	1	5	9	1	7	7
[T][S][L]	6	4	4	5	3	1	3	8	5	3	6	3
[T][S][L]Cache	7	3	3	8	7	1	2	6	9	5	5	6
[T][S]Sparse	8	12	1	6	11	3	1	3	14	4	15	4
sgd	7	16	5	6	12	4	3	8	17	7	8	7
step_sgd	3	8	2	5	8	2	1	6	8	3	9	3
step_tween	5	7	2	6	6	2	2	7	7	3	6	4
step_tween_chain	4	7	3	6	8	2	2	5	10	4	9	5
tween	8	11	4	7	11	3	3	6	16	5	10	6
tween_chain	11	11	4	12	11	7	4	10	12	8	11	7

Honesty - mean Score, every mode x dtype (cols 25-34)

Honesty - mean Score, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	7	9	5	8	10	5	3	10	11	8
Mesh[T]	5	4	4	7	5	3	3	8	12	10
Mesh[T]Alt	2	0	1	1	0	0	0	0	0	1
Mesh[T]Chain	6	6	2	9	5	3	3	7	6	5
Mesh[T][S]	5	3	2	5	5	2	1	6	4	5
Mesh[T][S][FP]	3	1	2	2	2	1	1	2	6	3
Mesh[T][S]Sparse	5	2	1	4	4	0	0	7	10	1
Step[T]Alt	2	2	2	1	2	0	0	3	2	2
Step[T][S]	5	8	7	6	8	2	1	10	12	5
[T]Alt	2	2	1	2	4	3	1	3	4	1
[T][S]	10	8	7	9	10	5	4	8	16	7
[T][S][FP]	11	5	6	7	8	4	2	9	9	6
[T][S][HP]	7	5	1	10	3	5	2	10	17	6
[T][S][HP]Async	8	5	7	12	5	5	1	7	8	3
[T][S][L]	5	2	4	4	5	2	1	6	4	3
[T][S][L]Cache	9	9	2	5	3	2	1	8	6	1
[T][S]Sparse	4	4	1	4	5	4	2	6	11	3
sgd	9	7	4	9	9	3	3	9	15	10
step_sgd	4	4	2	4	5	2	1	4	8	5
step_tween	5	4	4	5	4	3	2	3	6	3
step_tween_chain	5	6	4	5	6	2	2	4	8	5
tween	8	7	5	9	8	3	4	11	8	7
tween_chain	9	11	5	10	7	5	5	7	12	9

Honesty - mean hard Acc, every mode x dtype (cols 1-12)

Honesty - mean hard Acc, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	28	25	30	30	20	22	26	28	22	24	24	27
Mesh[T]	30	28	23	31	33	25	24	33	20	21	24	28
Mesh[T]Alt	35	23	25	29	15	21	21	35	6	23	27	15
Mesh[T]Chain	18	19	25	39	23	17	25	27	25	24	21	20
Mesh[T][S]	28	27	10	25	23	25	35	25	6	35	27	25
Mesh[T][S][FP]	24	20	23	10	33	35	21	26	19	21	10	25
Mesh[T][S]Sparse	23	24	35	29	21	18	24	27	10	21	20	29
Step[T]Alt	25	17	19	12	17	23	21	31	12	25	27	23
Step[T][S]	23	17	15	35	23	25	23	33	6	33	17	21
[T]Alt	2	42	4	25	15	31	29	27	17	17	31	35
[T][S]	21	25	30	16	31	29	25	30	19	23	24	17
[T][S][FP]	21	18	22	12	15	21	29	30	17	18	20	25
[T][S][HP]	35	27	40	17	9	26	15	25	2	28	32	22
[T][S][HP]Async	26	16	35	15	27	36	21	26	8	25	20	19
[T][S][L]	29	15	12	35	19	17	30	35		35	27	40
[T][S][L]Cache	23	20	12	12	21	19	26	19	8	29	19	21
[T][S]Sparse	26	27	15	25	26	27	17	30	2	24	48	35
sgd	21	15	11	20	13	25	16	16	8	18	13	14
step_sgd	16	14	12	13	15	22	13	17	7	15	17	8
step_tween	26	26	24	26	29	24	27	23	20	29	24	22
step_tween_chain	23	31	23	27	25	22	24	25	18	22	23	27
tween	26	26	22	25	25	22	24	25	15	20	18	21
tween_chain	30	24	25	20	30	25	26	28	25	24	26	23

Honesty - mean hard Acc, every mode x dtype (cols 13-24)

Honesty - mean hard Acc, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	20	22	22	28	19	16	20	20	25	16	27	38
Mesh[T]	19	28	20	25	31	17	21	25	33	39	21	30
Mesh[T]Alt	19	23	29	38	16	19	8	40	23	27	8	46
Mesh[T]Chain	26	24	18	24	21	14	20	22	25	19	31	24
Mesh[T][S]	27	36	4	21	25	4	17	20	31	25	18	12
Mesh[T][S][FP]	19	17	27	19	9	27	2	22	12	23	21	19
Mesh[T][S]Sparse	27	34	15	28	36	25	8	22	27	8	20	21
Step[T]Alt	29	35	38	29	21	12	19	19	25	15	27	25
Step[T][S]	35	32	29	23	31	18	6	15	27	33	38	40
[T]Alt	19	19	27	42	12	21	8	25	31	29	35	27
[T][S]	22	24	28	32	32	21	16	29	25	29	22	21
[T][S][FP]	29	19	24	29	25	25	4	26	15	35	11	35
[T][S][HP]	28	32	38	33	30	10	4	35	25	19	30	23
[T][S][HP]Async	29	12	27	9	19	17	4	21	32	6	30	34
[T][S][L]	31	24	35	27	22	12	17	46	22	23	34	19
[T][S][L]Cache	35	11	19	33	23	12	8	27	27	21	20	27
[T][S]Sparse	33	26	12	24	26	23	8	12	28	19	35	19
sgd	15	23	15	12	19	13	9	15	25	17	18	18
step_sgd	14	23	12	15	21	9	8	16	19	11	23	13
step_tween	29	26	24	27	25	21	21	31	21	25	20	25
step_tween_chain	25	23	16	25	24	21	18	23	25	21	28	24
tween	27	26	18	23	26	15	18	20	32	22	22	24
tween_chain	26	24	21	28	25	25	21	26	22	30	23	25

Honesty - mean hard Acc, every mode x dtype (cols 25-34)

Honesty - mean hard Acc, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	22	27	25	24	30	25	18	28	23	29
Mesh[T]	18	14	21	35	19	16	13	24	19	35
Mesh[T]Alt	40	10	25	15	10	10	4	12	15	15
Mesh[T]Chain	22	28	14	31	22	20	19	30	16	18
Mesh[T][S]	35	23	25	26	32	12	10	35	21	33
Mesh[T][S][FP]	24	4	25	14	17	21	12	20	25	23
Mesh[T][S]Sparse	34	17	10	26	31	4	4	41	43	12
Step[T]Alt	23	35	29	21	23	4	2	29	25	19
Step[T][S]	17	25	25	23	23	8	4	25	33	27
[T]Alt	17	12	12	15	31	44	8	25	27	8
[T][S]	28	26	26	25	29	21	24	22	32	22
[T][S][FP]	31	19	35	26	27	25	10	34	25	21
[T][S][HP]	17	18	6	30	12	17	6	30	35	17
[T][S][HP]Async	40	26	46	53	25	35	8	27	30	17
[T][S][L]	33	15	42	21	31	12	6	29	22	21
[T][S][L]Cache	38	48	15	23	10	12	4	38	17	6
[T][S]Sparse	17	17	10	19	27	35	15	26	29	17
sgd	16	16	12	17	19	9	12	17	19	18
step_sgd	13	13	9	12	16	10	8	11	20	17
step_tween	25	22	31	30	22	26	20	15	24	21
step_tween_chain	27	32	28	26	28	20	13	20	21	29
tween	29	23	21	27	26	19	23	29	21	22
tween_chain	29	28	26	27	21	31	22	21	23	30

Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	25	25	25	25	25	25	25	25	19	25	25	25
Mesh[T]	25	25	25	25	25	25	25	25	17	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	25	25	25	25	25	25	17	25	25	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	25	25	25	17	21	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
sgd	19	20	16	16	15	24	19	16	9	17	17	16
step_sgd	15	18	11	12	13	22	17	16	8	14	15	12
step_tween	25	25	25	25	25	25	25	25	20	25	25	25
step_tween_chain	25	25	25	25	25	25	23	25	19	23	25	25
tween	23	25	21	23	23	25	25	24	16	23	24	23
tween_chain	25	25	25	25	25	25	25	25	22	25	25	25

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	25	25	25	25	25	22	19	22	25	25	25	25
Mesh[T]	17	25	25	25	25	25	17	25	25	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	25	25	25	17	17	25	25	25	25	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	21	17	25	25	25	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
sgd	16	20	13	17	20	11	10	15	22	15	20	16
step_sgd	13	19	11	13	19	10	8	14	22	12	20	13
step_tween	25	25	25	25	25	23	22	25	25	25	25	25
step_tween_chain	23	25	25	25	25	23	20	25	25	25	25	25
tween	24	25	18	23	25	17	16	24	25	23	25	22
tween_chain	25	25	23	25	25	22	22	25	25	25	25	25

Honesty - mean SoftAcc, every mode x dtype (cols 25-34)

Honesty - mean SoftAcc, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	25	25	25	25	25	22	19	25	25	25
Mesh[T]	25	25	25	25	25	21	17	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	21	25	25	21	17	25	21	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	21	21	25	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25
sgd	17	16	13	17	16	11	10	16	20	15
step_sgd	13	14	11	14	15	9	9	14	19	14
step_tween	25	25	23	25	25	25	20	25	25	25
step_tween_chain	25	25	23	25	25	23	23	25	23	25
tween	23	22	19	25	25	16	18	24	25	22
tween_chain	25	25	23	25	25	24	21	24	24	25

Honesty - mean Avail, every mode x dtype (cols 1-12)

Honesty - mean Avail, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	20	16	23	23	22	19	24	20	25	21	23	23
Mesh[T]	20	16	22	21	21	18	20	18	23	21	20	20
Mesh[T]Alt	13	11	16	14	14	12	13	12	18	15	15	16
Mesh[T]Chain	21	16	24	20	23	19	22	19	23	22	22	23
Mesh[T][S]	28	22	29	30	26	24	27	24	32	29	27	29
Mesh[T][S][FP]	28	23	30	29	29	25	27	24	31	28	28	30
Mesh[T][S]Sparse	31	29	33	34	32	30	32	31	35	33	32	33
Step[T]Alt	12	8	14	14	14	11	14	12	16	13	13	15
Step[T][S]	20	18	23	23	22	19	22	20	24	22	20	24
[T]Alt	13	11	16	16	16	13	15	13	18	15	15	16
[T][S]	25	22	30	30	28	24	27	25	32	27	27	28
[T][S][FP]	27	22	31	30	28	24	27	25	32	28	28	29
[T][S][HP]	27	22	29	31	28	23	27	24	32	27	29	29
[T][S][HP]Async	26	23	29	30	29	23	27	26	31	29	29	30
[T][S][L]	20	14	23	23	21	18	24	20	24	21	22	24
[T][S][L]Cache	26	24	27	28	27	23	26	25	32	27	26	28
[T][S]Sparse	32	30	33	34	33	31	33	30	34	33	33	34
sgd	22	17	24	24	23	20	23	20	24	23	23	25
step_sgd	15	14	18	20	18	17	19	17	20	19	19	18
step_tween	17	13	19	18	17	15	16	14	18	17	18	18
step_tween_chain	16	15	19	18	18	16	17	16	18	16	18	18
tween	19	16	22	20	20	17	20	17	22	21	21	21
tween_chain	21	17	23	23	23	18	22	18	24	22	22	23

Honesty - mean Avail, every mode x dtype (cols 13-24)

Honesty - mean Avail, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	23	16	24	23	17	23	24	22	19	23	16	22
Mesh[T]	20	16	23	20	16	24	23	22	17	21	16	21
Mesh[T]Alt	17	10	15	16	9	17	17	16	12	13	10	16
Mesh[T]Chain	23	17	25	23	16	24	25	22	17	21	17	23
Mesh[T][S]	30	22	31	28	21	31	32	28	22	28	22	29
Mesh[T][S][FP]	29	23	30	29	22	31	33	29	22	28	22	28
Mesh[T][S]Sparse	32	30	35	33	29	34	34	34	30	33	29	33
Step[T]Alt	13	9	14	14	9	15	15	14	10	13	8	15
Step[T][S]	22	18	23	23	17	24	23	22	18	22	18	23
[T]Alt	16	11	17	15	11	17	19	15	10	16	11	16
[T][S]	28	21	31	29	23	32	32	28	23	28	23	29
[T][S][FP]	28	20	31	29	22	31	31	28	22	27	21	31
[T][S][HP]	29	21	31	27	23	32	32	29	23	28	22	28
[T][S][HP]Async	29	20	30	29	21	30	30	29	22	28	21	30
[T][S][L]	23	14	24	23	15	24	25	23	16	23	14	23
[T][S][L]Cache	29	20	30	28	21	31	32	29	22	29	21	30
[T][S]Sparse	33	29	34	34	30	34	35	34	30	34	29	33
sgd	23	18	27	25	17	24	24	22	19	23	17	23
step_sgd	18	15	20	19	15	21	18	18	15	18	14	17
step_tween	17	14	19	17	13	17	19	17	14	17	14	16
step_tween_chain	17	15	19	18	16	17	21	19	16	19	14	18
tween	21	16	22	21	16	19	22	21	17	20	16	23
tween_chain	24	18	22	23	17	22	25	23	17	21	18	22

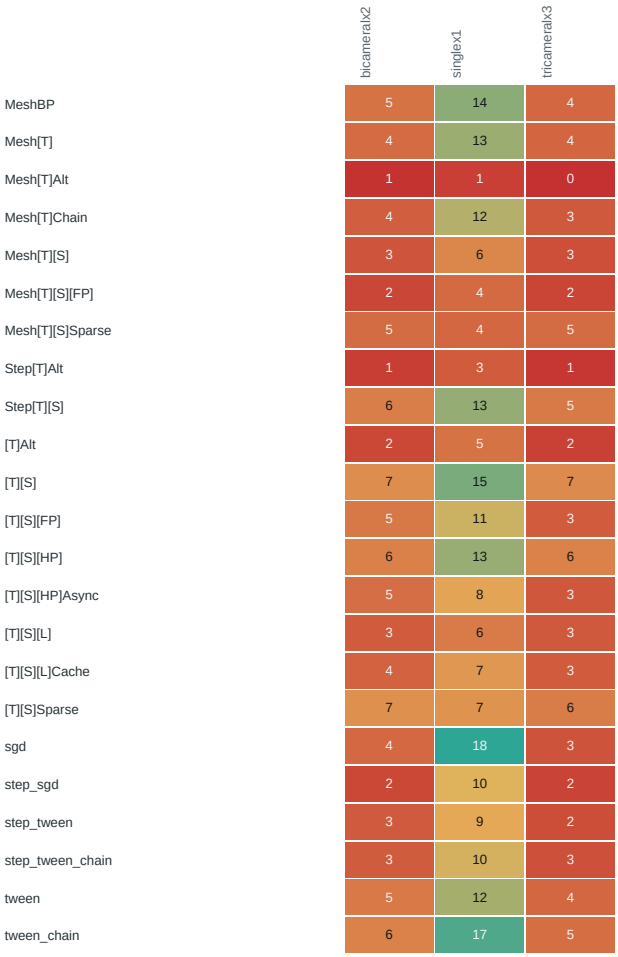
Honesty - mean Avail, every mode x dtype (cols 25-34)

Honesty - mean Avail, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	22	23	24	23	24	24	25	24	21	22
Mesh[T]	22	21	20	19	21	21	22	21	20	21
Mesh[T]Alt	16	15	15	16	16	18	16	15	13	16
Mesh[T]Chain	20	22	22	22	23	24	23	21	20	22
Mesh[T][S]	28	30	30	30	29	32	31	26	25	30
Mesh[T][S][FP]	29	27	29	28	29	32	32	29	26	30
Mesh[T][S]Sparse	32	33	34	33	33	33	35	34	31	34
Step[T]Alt	14	13	15	13	14	15	16	13	12	13
Step[T][S]	22	23	25	23	22	24	25	22	19	22
[T]Alt	15	16	18	17	17	18	16	16	14	16
[T][S]	29	30	32	29	30	31	31	28	26	28
[T][S][FP]	29	30	30	29	28	30	31	29	25	29
[T][S][HP]	30	29	30	28	29	31	31	30	26	30
[T][S][HP]Async	29	29	31	29	30	31	32	30	26	29
[T][S][L]	21	23	26	23	23	26	25	23	18	24
[T][S][L]Cache	28	29	32	28	29	31	31	29	26	29
[T][S]Sparse	32	33	34	33	31	33	35	33	32	33
sgd	25	23	26	23	23	23	25	24	21	24
step_sgd	17	18	18	19	19	19	20	19	18	18
step_tween	17	18	19	16	17	19	17	18	15	17
step_tween_chain	18	18	19	18	18	19	19	18	17	18
tween	21	21	23	23	22	21	23	22	19	21
tween_chain	21	23	22	23	23	25	25	21	20	23

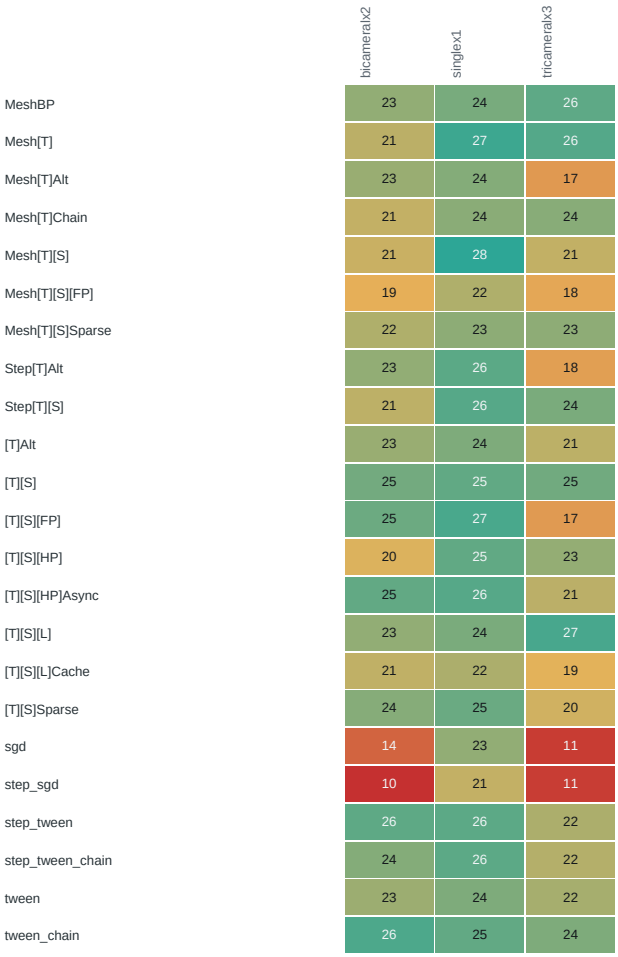
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch



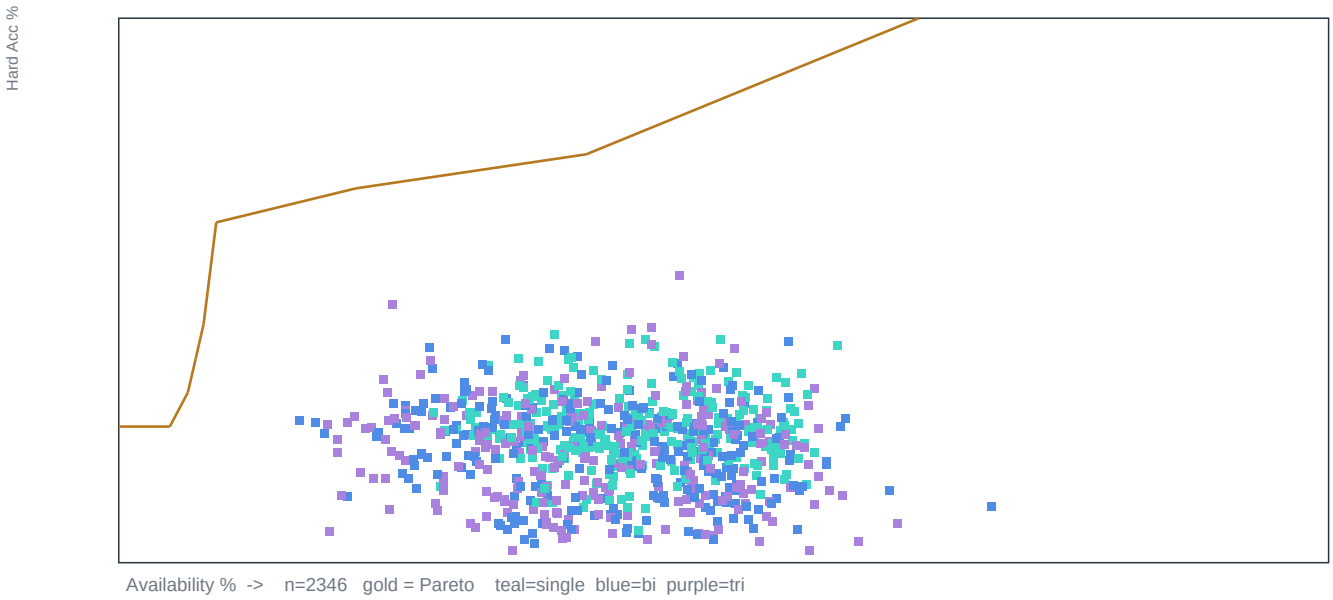
	bicameralx2	singlex1	tricameralx3
MeshBP	23	24	26
Mesh[T]	21	27	26
Mesh[T]Alt	23	24	17
Mesh[T]Chain	21	24	24
Mesh[T][S]	21	28	21
Mesh[T][S][FP]	19	22	18
Mesh[T][S]Sparse	22	23	23
Step[T]Alt	23	26	18
Step[T][S]	21	26	24
[T]Alt	23	24	21
[T][S]	25	25	25
[T][S][FP]	25	27	17
[T][S][HP]	20	25	23
[T][S][HP]Async	25	26	21
[T][S][L]	23	24	27
[T][S][L]Cache	21	22	19
[T][S]Sparse	24	25	20
sgd	14	23	11
step_sgd	10	21	11
step_tween	26	26	22
step_tween_chain	24	26	22
tween	23	24	22
tween_chain	26	25	24

Mean Avail, every mode x arch

Mean Avail, every mode x arch

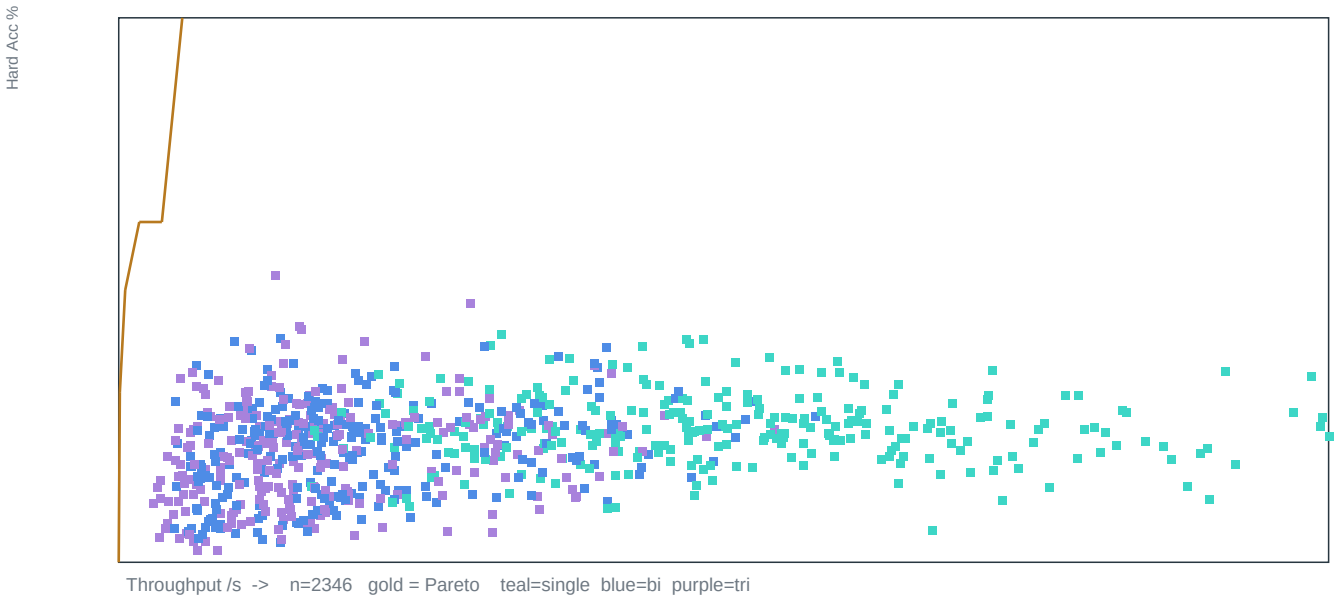
	bicamerax2	singlex1	tricamerax3
MeshBP	21	22	22
Mesh[T]	20	20	20
Mesh[T]Alt	15	14	15
Mesh[T]Chain	21	22	21
Mesh[T][S]	29	25	29
Mesh[T][S][FP]	29	26	29
Mesh[T][S]Sparse	36	25	37
Step[T]Alt	13	13	13
Step[T][S]	22	20	22
[T]Alt	15	15	15
[T][S]	29	26	29
[T][S][FP]	29	25	29
[T][S][HP]	29	25	29
[T][S][HP]Async	29	26	29
[T][S][L]	23	19	23
[T][S][L]Cache	28	25	29
[T][S]Sparse	36	26	36
sgd	22	24	22
step_sgd	18	19	17
step_tween	17	17	16
step_tween_chain	17	18	17
tween	20	20	20
tween_chain	21	23	21

Pillars - Availability vs hard Acc

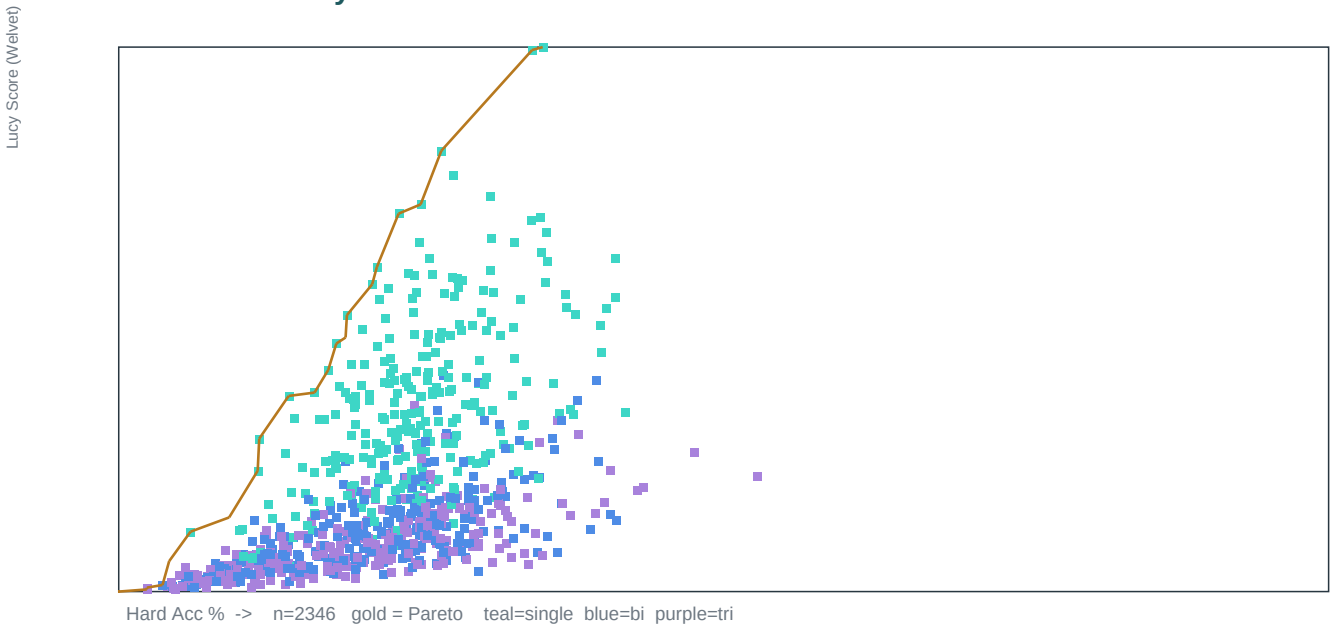


Pillars - Throughput vs hard Acc

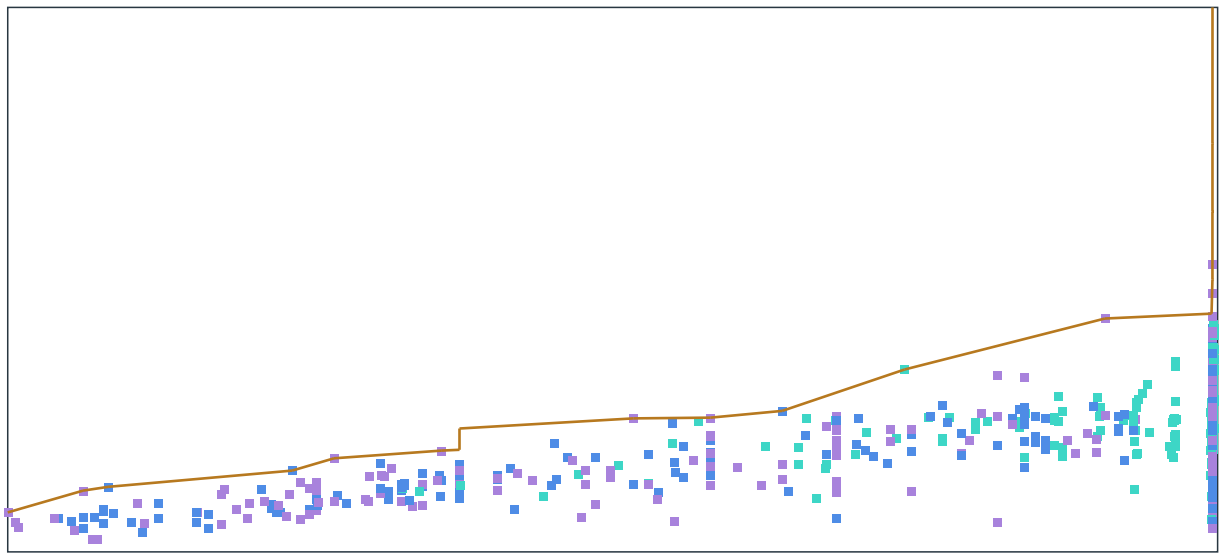
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

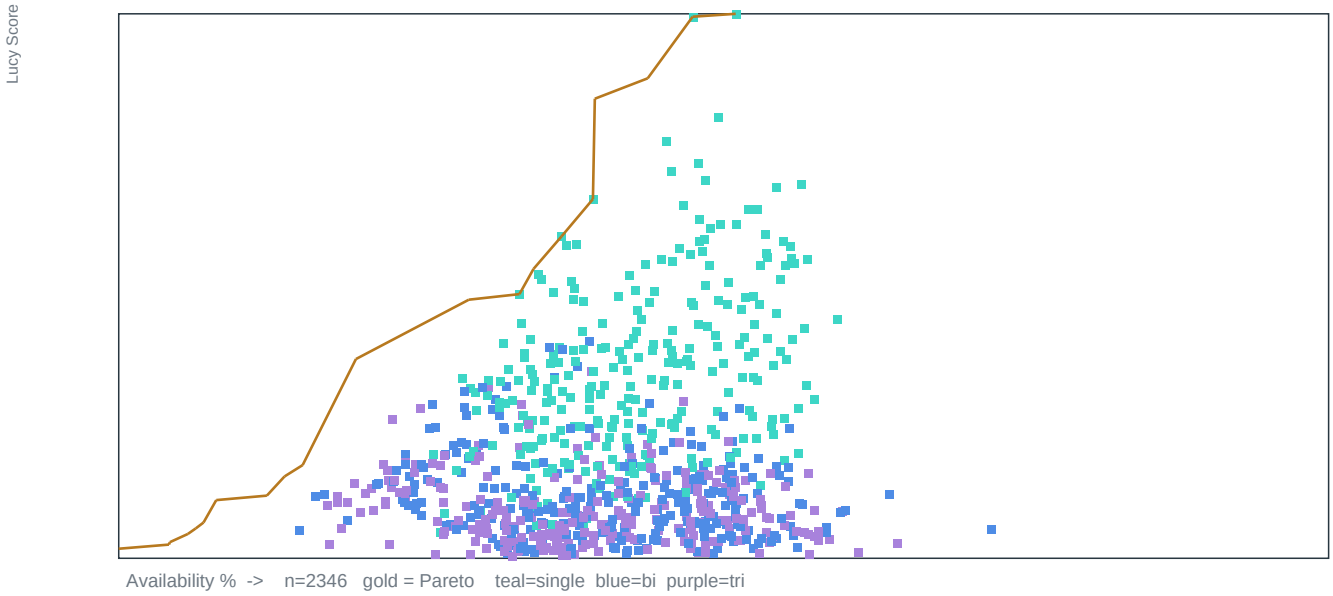


SoftAcc (serve-confidence) vs hard Acc

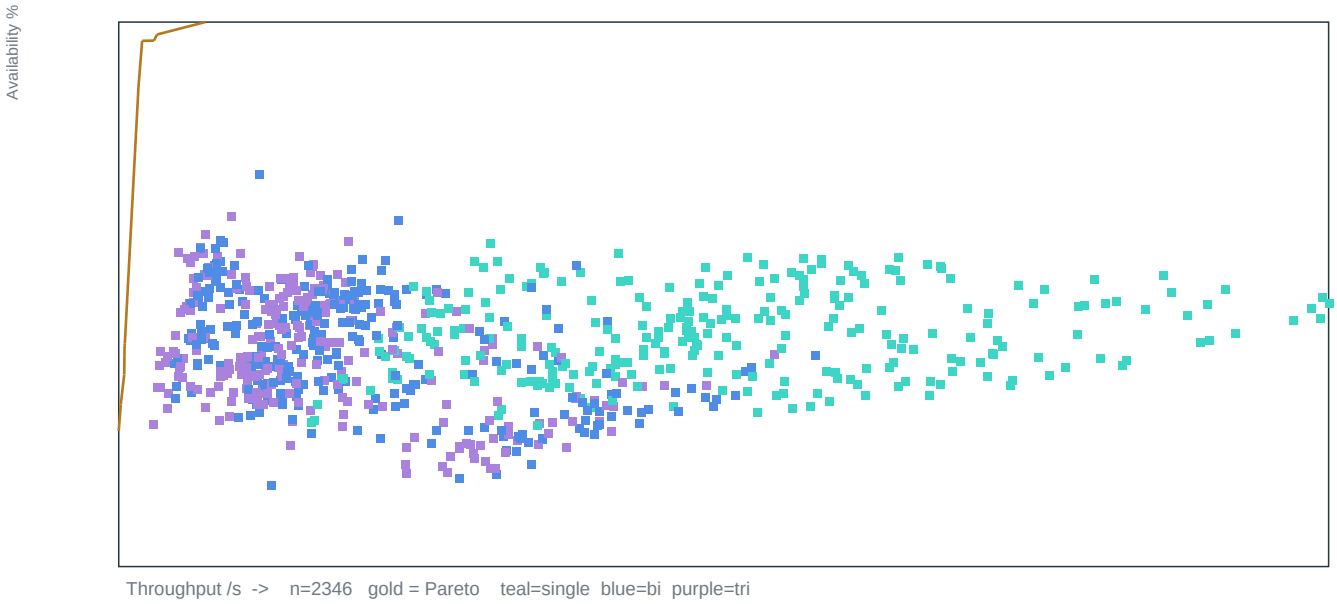



SoftAcc % -> n=2346 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

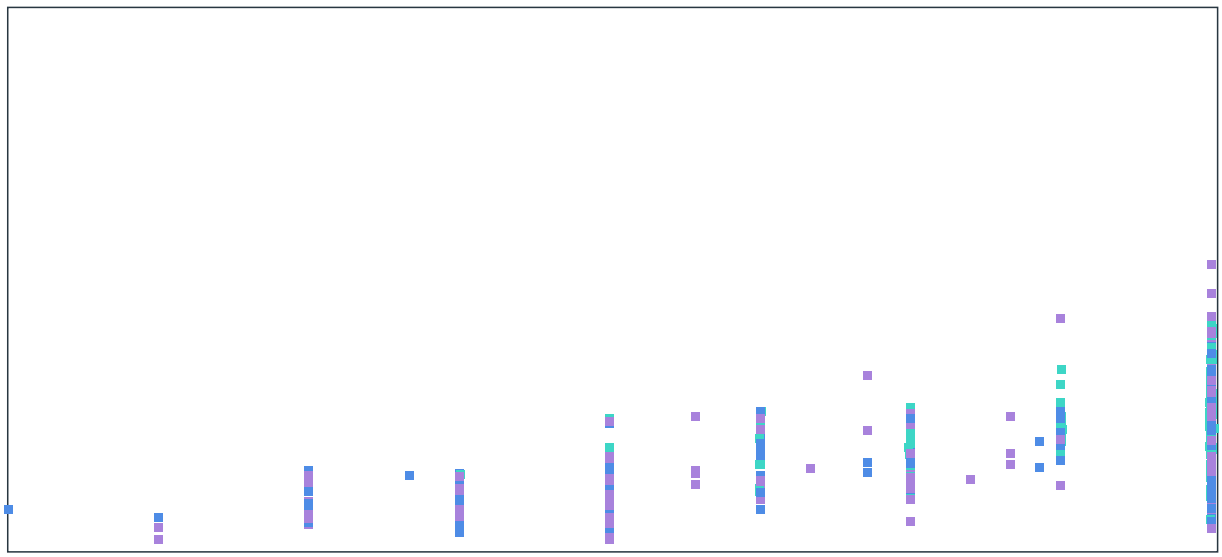
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



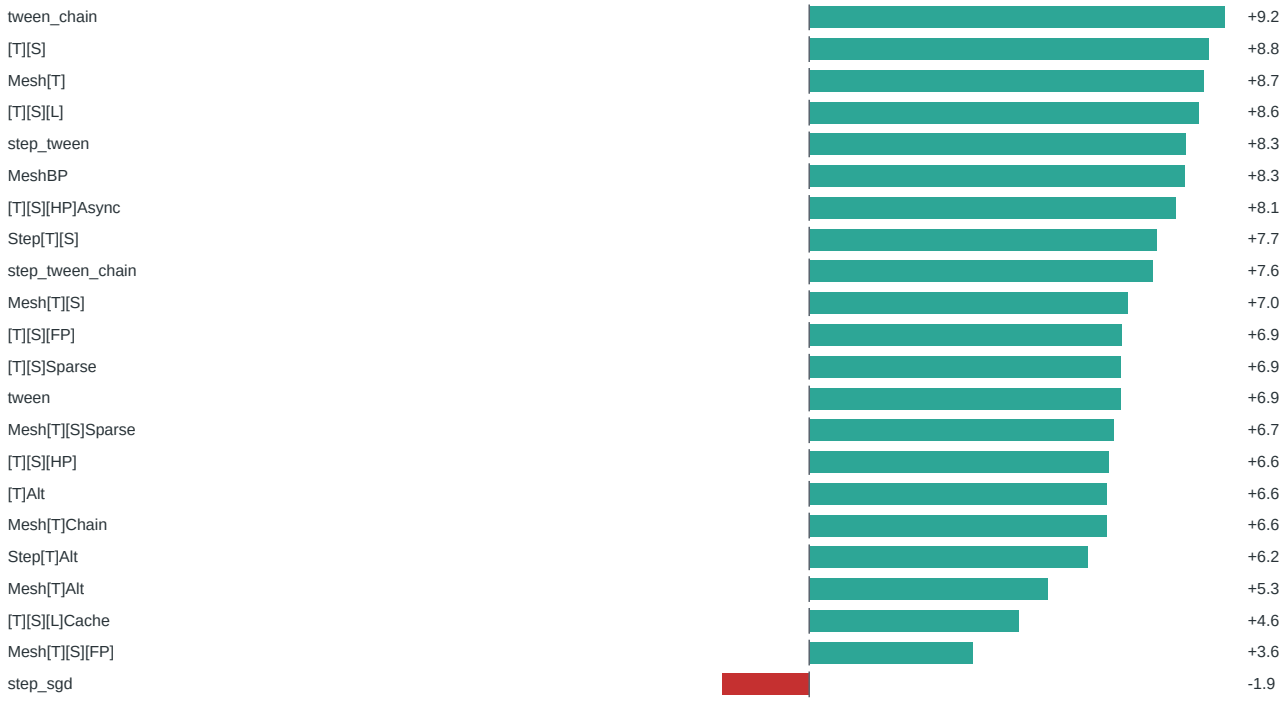

AdaptPct % -> n=2346 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
tween_chain	102	+9.2	83	+8.2	-0.9	-21	+0.6	56
[T][S]	102	+8.8	77	+7.9	+5.3	-50	+0.9	56
Mesh[T]	102	+8.7	76	+7.7	-2.4	-49	-1.3	33
[T][S][L]	102	+8.6	65	+8.8	-0.9	-110	-4.4	23
step_tween	102	+8.3	80	+8.4	-5.9	-72	-3.6	10
MeshBP	102	+8.3	78	+8.1	-0.7	-43	-0.8	45
[T][S][HP]Async	102	+8.1	66	+8.8	+5.3	-109	-3.1	26
Step[T][S]	102	+7.7	68	+8.8	-0.8	-35	-0.3	43
step_tween_chain	102	+7.6	79	+8.0	-5.0	-64	-3.0	10
Mesh[T][S]	102	+7.0	67	+8.8	+5.1	-129	-4.5	15
[T][S][FP]	102	+6.9	66	+8.8	+5.3	-87	-2.0	30
[T][S]Sparse	102	+6.9	66	+8.8	+10.1	-103	-1.8	44
tween	102	+6.9	81	+6.2	-2.3	-32	-1.1	39
Mesh[T][S]Sparse	102	+6.7	62	+8.8	+10.0	-132	-4.0	26
[T][S][HP]	102	+6.6	55	+8.8	+5.4	-59	-0.1	40
[T]Alt	102	+6.6	59	+8.8	-7.4	-105	-5.6	9
Mesh[T]Chain	102	+6.6	74	+7.5	-1.1	-62	-2.2	23
Step[T]Alt	102	+6.2	62	+8.8	-9.6	-127	-6.6	1
Mesh[T]Alt	102	+5.3	60	+8.8	-8.0	-163	-7.6	0
[T][S][L]Cache	102	+4.6	55	+8.8	+4.9	-102	-3.6	22
Mesh[T][S][FP]	102	+3.6	52	+8.8	+5.3	-139	-5.7	6
step_sgd	102	-1.9	30	-2.1	-4.7	-49	-4.0	1

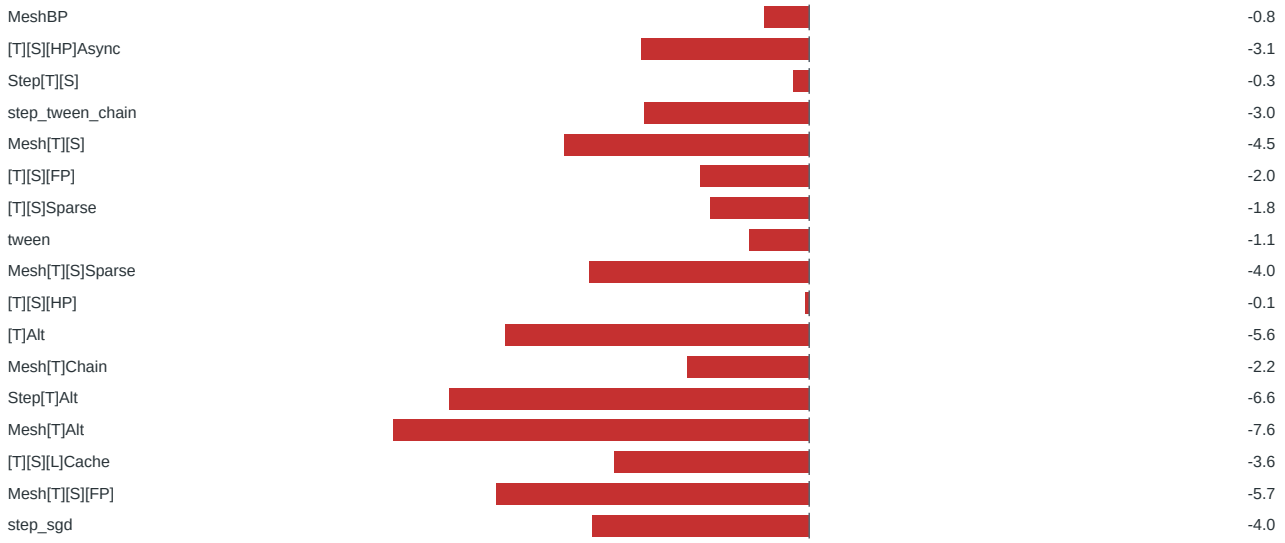
mean AccD vs sgd



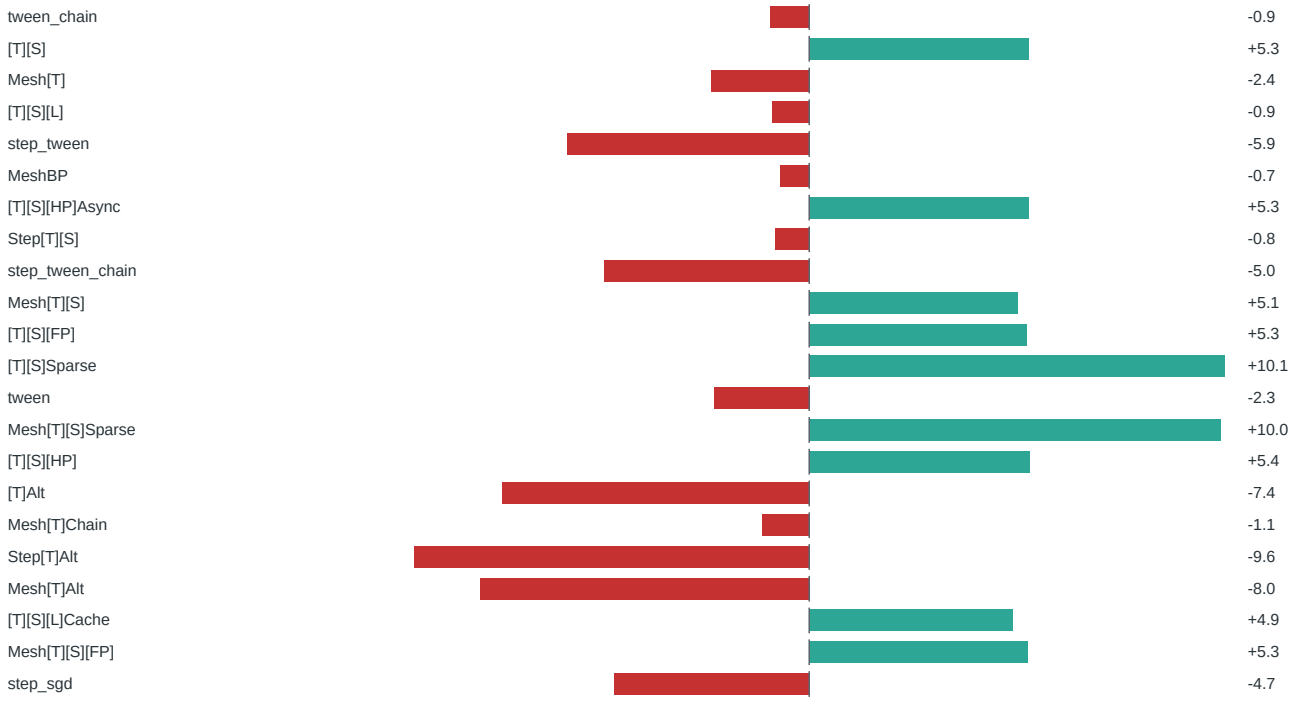
mean ScoreD vs sgd (duty clock)



mean ScoreD vs sgd (duty clock)



mean AvailD vs sgd



AccD vs sgd, every mode x dtype (cols 1-12)

AccD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	+7	+10	+19	+10	+7	-3	+10	+12	+14	+6	+11	+13
Mesh[T]	+9	+13	+11	+11	+20	+1	+8	+17	+12	+3	+11	+15
Mesh[T]Alt	+15	+8	+14	+9	+1	-4	+5	+19	-2	+5	+14	+1
Mesh[T]Chain	-3	+4	+13	+19	+9	-8	+8	+11	+17	+6	+8	+6
Mesh[T][S]	+7	+12	-1	+5	+10	+1	+18	+9	-2	+18	+14	+11
Mesh[T][S][FP]	+3	+5	+12	-10	+20	+10	+5	+10	+11	+3	-3	+11
Mesh[T][S]Sparse	+2	+9	+24	+9	+8	-7	+8	+11	+2	+3	+7	+15
Step[T]Alt	+4	+2	+7	-8	+3	-2	+5	+15	+4	+7	+14	+9
Step[T][S]	+2	+2	+3	+15	+10	+0	+7	+17	-2	+16	+3	+7
[T]Alt	-19	+27	-7	+5	+1	+6	+13	+11	+9	-1	+18	+22
[T][S]	+1	+10	+19	-4	+18	+4	+9	+14	+11	+5	+11	+4
[T][S][FP]	+0	+3	+11	-8	+1	-4	+13	+14	+9	+0	+7	+11
[T][S][HP]	+15	+12	+28	-3	-4	+1	-1	+9	-6	+10	+19	+8
[T][S][HP]Async	+5	+1	+24	-5	+14	+11	+5	+10	+0	+7	+7	+5
[T][S][L]	+8	-0	+1	+15	+6	-8	+14	+19	-8	+18	+14	+26
[T][S][L]Cache	+2	+5	+1	-8	+8	-6	+10	+3	+0	+11	+6	+7
[T][S]Sparse	+5	+12	+4	+5	+13	+2	+0	+14	-6	+6	+35	+22
step_sgd	-4	-1	+0	-7	+1	-3	-3	+1	-1	-3	+4	-6
step_tween	+5	+11	+13	+6	+16	-1	+11	+7	+12	+11	+11	+8
step_tween_chain	+2	+16	+12	+7	+12	-3	+8	+9	+10	+4	+9	+13
tween	+5	+11	+10	+5	+12	-3	+8	+9	+7	+3	+5	+8
tween_chain	+9	+9	+14	-0	+16	+0	+10	+12	+17	+6	+13	+9

AccD vs sgd, every mode x dtype (cols 13-24)

AccD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	+5	-1	+7	+15	-0	+4	+11	+5	-0	-1	+8	+20
Mesh[T]	+4	+5	+4	+13	+12	+4	+12	+9	+8	+22	+3	+12
Mesh[T]Alt	+4	-0	+14	+25	-4	+6	-1	+24	-2	+10	-10	+28
Mesh[T]Chain	+11	+0	+3	+12	+1	+2	+11	+7	-0	+2	+13	+6
Mesh[T][S]	+12	+13	-11	+8	+6	-9	+8	+5	+5	+8	-0	-5
Mesh[T][S][FP]	+4	-6	+12	+7	-10	+14	-7	+6	-14	+6	+3	+1
Mesh[T][S]Sparse	+12	+10	-1	+15	+17	+12	-1	+6	+2	-9	+2	+3
Step[T]Alt	+14	+12	+22	+17	+2	-0	+10	+3	-0	-2	+9	+7
Step[T][S]	+20	+9	+14	+11	+12	+6	-3	-1	+2	+16	+19	+22
[T]Alt	+4	-5	+12	+29	-7	+8	-1	+10	+6	+12	+17	+9
[T][S]	+7	+1	+13	+20	+13	+8	+7	+14	-0	+12	+4	+3
[T][S][FP]	+14	-4	+9	+17	+6	+12	-5	+10	-11	+19	-7	+18
[T][S][HP]	+14	+8	+22	+20	+10	-2	-5	+20	-0	+2	+12	+5
[T][S][HP]Async	+14	-11	+12	-3	-1	+4	-5	+6	+6	-11	+11	+17
[T][S][L]	+16	+1	+20	+15	+3	-0	+8	+31	-3	+6	+16	+1
[T][S][L]Cache	+20	-12	+3	+21	+4	-0	-1	+11	+2	+4	+2	+9
[T][S]Sparse	+18	+2	-3	+12	+6	+10	-1	-3	+3	+2	+17	+1
step_sgd	-1	-1	-3	+3	+2	-4	-1	+1	-7	-6	+5	-5
step_tween	+14	+2	+8	+15	+6	+8	+12	+16	-5	+8	+2	+7
step_tween_chain	+10	-0	+1	+13	+4	+8	+9	+8	-0	+4	+9	+6
tween	+12	+2	+3	+11	+6	+3	+9	+5	+6	+5	+4	+6
tween_chain	+11	+0	+6	+16	+6	+13	+12	+11	-3	+13	+5	+7

AccD vs sgd, every mode x dtype (cols 25-34)

AccD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+6	+11	+13	+7	+11	+15	+6	+11	+3	+10
Mesh[T]	+2	-2	+9	+18	+0	+7	+1	+7	-0	+17
Mesh[T]Alt	+23	-6	+13	-3	-8	+1	-8	-4	-5	-4
Mesh[T]Chain	+6	+12	+2	+14	+3	+10	+8	+13	-3	-0
Mesh[T][S]	+19	+7	+13	+9	+13	+3	-1	+18	+1	+15
Mesh[T][S][FP]	+7	-12	+13	-3	-2	+11	+1	+3	+6	+5
Mesh[T][S]Sparse	+18	+1	-1	+9	+12	-5	-8	+24	+23	-6
Step[T]Alt	+7	+19	+17	+4	+4	-5	-10	+12	+6	+1
Step[T][S]	+0	+9	+13	+6	+4	-1	-8	+8	+14	+9
[T]Alt	+0	-3	+1	-3	+12	+34	-3	+8	+8	-10
[T][S]	+12	+10	+15	+7	+10	+11	+12	+5	+12	+4
[T][S][FP]	+15	+4	+24	+9	+8	+16	-1	+17	+5	+3
[T][S][HP]	+1	+2	-6	+13	-7	+7	-6	+13	+16	-2
[T][S][HP]Async	+23	+10	+34	+36	+6	+26	-3	+10	+11	-2
[T][S][L]	+17	-1	+30	+4	+12	+3	-6	+12	+2	+3
[T][S][L]Cache	+21	+32	+3	+6	-8	+3	-8	+21	-3	-12
[T][S]Sparse	+1	+1	-1	+2	+8	+26	+3	+9	+10	-2
step_sgd	-3	-3	-3	-5	-3	+1	-4	-6	+1	-1
step_tween	+8	+6	+19	+13	+3	+16	+9	-2	+5	+3
step_tween_chain	+10	+16	+16	+9	+9	+11	+2	+3	+2	+11
tween	+12	+7	+9	+10	+7	+10	+11	+12	+2	+3
tween_chain	+12	+12	+14	+10	+2	+21	+10	+4	+3	+12

ScoreD vs sgd, every mode x dtype (cols 1-12)

ScoreD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	-2	-0	+3	-2	+1	-6	+2	+1	+2	-3	+1	+1
Mesh[T]	-1	+1	-1	-2	+0	-7	-1	+1	+2	-2	+1	+0
Mesh[T]Alt	-10	-7	-5	-10	-7	-17	-10	-8	-2	-9	-6	-5
Mesh[T]Chain	-6	-2	+1	-2	+0	-8	-2	+0	+2	-1	+1	-1
Mesh[T][S]	-6	-3	-4	-6	-4	-11	-3	-5	-1	-3	-2	-2
Mesh[T][S][FP]	-7	-5	-3	-9	-2	-10	-7	-5	-1	-6	-5	-3
Mesh[T][S]Sparse	-7	-2	-1	-6	-4	-12	-5	-3	-1	-5	-3	-2
Step[T]Alt	-10	-7	-4	-9	-5	-15	-9	-6	-1	-7	-5	-5
Step[T][S]	-2	+4	-1	-0	-0	-5	-1	+2	-1	+2	-4	+1
[T]Alt	-11	-4	-5	-8	-6	-10	-6	-5	+0	-7	-3	-2
[T][S]	-2	+3	+4	-4	+5	+0	+1	+5	+2	-1	+2	-1
[T][S][FP]	-1	-3	+1	-7	-3	-8	-1	+0	+2	-4	-1	-0
[T][S][HP]	+2	+5	+6	-3	-3	-4	-2	+1	-1	-0	+4	+1
[T][S][HP]Async	-5	-3	+1	-7	-2	-4	-5	-2	-1	-4	-2	-2
[T][S][L]	-6	-6	-4	-5	-4	-13	-4	-2	-2	-3	-2	-0
[T][S][L]Cache	-4	-2	-3	-8	-3	-12	-4	-5	-0	-1	-3	-3
[T][S]Sparse	-3	+6	-2	-5	+0	-3	-5	-0	-2	-3	+6	+2
step_sgd	-7	-3	-3	-7	-3	-6	-5	-3	-1	-4	-2	-4
step_tween	-5	-1	-2	-5	-2	-8	-5	-3	+0	-3	-1	-2
step_tween_chain	-5	+1	-1	-6	-2	-7	-4	-3	+0	-5	-2	-2
tween	-2	+1	-0	-3	-0	-8	-1	-1	+1	-4	-0	-0
tween_chain	+2	+3	+2	-3	+4	-3	+2	+2	+3	-1	+2	+2

ScoreD vs sgd, every mode x dtype (cols 13-24)

ScoreD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	-1	-8	+0	+2	-7	-1	+1	-3	-6	-3	+0	+4
Mesh[T]	-2	-7	-1	-0	+1	-0	+1	+1	-7	+2	-1	-1
Mesh[T]Alt	-6	-15	-5	-5	-12	-3	-2	-6	-16	-6	-8	-6
Mesh[T]Chain	-1	-7	-2	-0	-5	-1	+1	-4	-9	-4	+3	-1
Mesh[T][S]	-2	-9	-5	-3	-8	-3	-0	-5	-11	-5	-5	-5
Mesh[T][S][FP]	-4	-13	-4	-4	-11	-1	-2	-6	-15	-5	-5	-5
Mesh[T][S]Sparse	-3	-6	-4	-1	-0	-1	-2	-5	-8	-6	-2	-4
Step[T]Alt	-5	-11	-3	-3	-11	-3	-2	-7	-15	-6	-7	-5
Step[T][S]	+5	-3	+2	+1	+1	-1	-1	-5	-4	+1	+10	+2
[T]Alt	-4	-14	-3	-1	-11	-2	-1	-5	-13	-5	-3	-4
[T][S]	+1	-5	+2	+4	+4	+1	+1	+2	-3	+0	+3	+0
[T][S][FP]	+2	-10	-0	+2	-3	+0	-2	-2	-11	-1	-5	+0
[T][S][HP]	+3	-2	+3	+5	+2	-2	-1	+3	-4	-3	+2	+1
[T][S][HP]Async	-1	-14	-2	-3	-7	-1	-2	-4	-8	-6	-1	-1
[T][S][L]	-1	-12	-1	-1	-9	-2	-0	-1	-13	-4	-3	-5
[T][S][L]Cache	+0	-14	-3	+2	-5	-3	-1	-2	-8	-3	-3	-2
[T][S]Sparse	+1	-5	-4	-0	-1	-0	-1	-5	-3	-4	+7	-3
step_sgd	-3	-8	-3	-1	-5	-2	-1	-3	-10	-5	+0	-4
step_tween	-2	-9	-3	-0	-6	-2	-1	-2	-11	-4	-2	-4
step_tween_chain	-3	-9	-3	+0	-4	-1	-1	-3	-8	-4	+0	-3
tween	+1	-5	-1	+1	-1	-1	+0	-2	-2	-3	+1	-1
tween_chain	+4	-5	-1	+6	-1	+3	+2	+1	-6	+0	+2	-1

ScoreD vs sgd, every mode x dtype (cols 25-34)

ScoreD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	-2	+2	+1	-1	+1	+2	+0	+1	-5	-2
Mesh[T]	-3	-4	-0	-2	-5	-0	-1	-1	-4	-0
Mesh[T]Alt	-7	-7	-4	-9	-9	-3	-3	-9	-15	-9
Mesh[T]Chain	-3	-1	-2	+0	-4	+0	-0	-2	-10	-5
Mesh[T][S]	-4	-4	-2	-4	-4	-1	-2	-3	-11	-5
Mesh[T][S][FP]	-5	-7	-3	-7	-7	-2	-2	-7	-10	-7
Mesh[T][S]Sparse	-4	-5	-3	-5	-5	-3	-3	-2	-5	-8
Step[T]Alt	-7	-5	-3	-8	-7	-3	-3	-6	-13	-8
Step[T][S]	-3	+1	+3	-3	-1	-1	-2	+1	-3	-4
[T]Alt	-7	-6	-3	-7	-5	+0	-2	-6	-12	-8
[T][S]	+2	+1	+3	+0	+1	+2	+1	-1	+1	-3
[T][S][FP]	+2	-3	+1	-3	-1	+1	-1	-0	-6	-4
[T][S][HP]	-2	-2	-3	+0	-6	+2	-1	+1	+1	-4
[T][S][HP]Async	-1	-2	+2	+3	-4	+2	-2	-2	-7	-7
[T][S][L]	-4	-5	-0	-5	-4	-2	-2	-3	-11	-7
[T][S][L]Cache	+0	+1	-2	-4	-6	-1	-2	-1	-10	-9
[T][S]Sparse	-4	-4	-3	-5	-4	+1	-1	-3	-4	-6
step_sgd	-5	-3	-2	-5	-5	-1	-2	-5	-8	-5
step_tween	-4	-3	-0	-4	-5	+0	-1	-6	-9	-7
step_tween_chain	-4	-1	-1	-4	-3	-1	-1	-5	-7	-5
tween	-0	-0	+1	+0	-1	+0	+1	+2	-7	-3
tween_chain	+0	+4	+1	+0	-2	+2	+2	-2	-3	-1

AvailD vs sgd, every mode x dtype (cols 1-12)

AvailD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	-2	-1	-1	-1	-0	-1	+1	-0	+1	-2	+0	-1
Mesh[T]	-2	-1	-2	-3	-2	-3	-3	-2	-1	-2	-3	-5
Mesh[T]Alt	-8	-6	-8	-11	-8	-8	-10	-7	-6	-8	-8	-8
Mesh[T]Chain	-1	-1	-0	-4	+0	-1	-1	-1	-0	-1	-1	-2
Mesh[T][S]	+6	+5	+5	+6	+4	+3	+4	+4	+8	+6	+4	+4
Mesh[T][S][FP]	+6	+6	+6	+5	+6	+4	+4	+4	+7	+5	+5	+5
Mesh[T][S]Sparse	+9	+12	+10	+9	+10	+10	+9	+12	+11	+10	+9	+9
Step[T]Alt	-10	-8	-10	-10	-9	-9	-9	-8	-8	-10	-10	-10
Step[T][S]	-1	+2	-1	-1	-0	-1	-1	+0	+1	-1	-3	-1
[T]Alt	-9	-6	-8	-8	-7	-7	-8	-6	-6	-8	-8	-9
[T][S]	+4	+5	+7	+6	+6	+4	+4	+5	+8	+4	+4	+4
[T][S][FP]	+5	+5	+7	+6	+5	+4	+4	+5	+9	+5	+5	+5
[T][S][HP]	+5	+5	+5	+7	+6	+3	+4	+4	+8	+4	+6	+4
[T][S][HP]Async	+4	+6	+5	+6	+6	+3	+4	+6	+8	+6	+5	+5
[T][S][L]	-2	-3	-0	-1	-1	-3	+1	+0	+1	-2	-1	-1
[T][S][L]Cache	+4	+7	+4	+4	+4	+3	+3	+5	+8	+4	+3	+3
[T][S]Sparse	+11	+13	+10	+9	+10	+11	+10	+10	+11	+10	+10	+10
step_sgd	-7	-3	-6	-4	-5	-3	-4	-3	-4	-4	-4	-6
step_tween	-5	-3	-5	-7	-6	-5	-7	-6	-5	-6	-5	-7
step_tween_chain	-6	-2	-5	-6	-5	-4	-6	-4	-5	-7	-5	-6
tween	-3	-0	-2	-4	-3	-3	-3	-3	-1	-2	-2	-4
tween_chain	-0	+0	-1	-1	+0	-2	-2	-1	+0	-1	-1	-1

AvailD vs sgd, every mode x dtype (cols 13-24)

AvailD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	-1	-1	-3	-2	-1	-1	+0	-1	-1	-1	-0	-1
Mesh[T]	-3	-2	-4	-5	-1	-1	-1	+0	-3	-3	-1	-2
Mesh[T]Alt	-6	-8	-11	-9	-8	-7	-7	-7	-7	-10	-6	-7
Mesh[T]Chain	-1	-0	-2	-1	-1	-0	+1	-0	-3	-2	+1	-1
Mesh[T][S]	+7	+4	+4	+3	+4	+7	+8	+6	+2	+4	+5	+6
Mesh[T][S][FP]	+5	+5	+3	+4	+5	+7	+9	+6	+3	+5	+5	+4
Mesh[T][S]Sparse	+9	+12	+8	+8	+12	+10	+10	+11	+11	+10	+13	+10
Step[T]Alt	-10	-8	-13	-11	-8	-9	-9	-8	-9	-10	-8	-9
Step[T][S]	-1	+0	-4	-2	-0	-0	-1	-1	-1	-2	+2	-0
[T]Alt	-8	-7	-9	-9	-7	-7	-5	-7	-9	-8	-6	-7
[T][S]	+5	+4	+5	+4	+6	+8	+8	+6	+3	+5	+7	+5
[T][S][FP]	+5	+3	+4	+4	+5	+7	+7	+5	+3	+4	+5	+8
[T][S][HP]	+6	+3	+4	+3	+6	+8	+8	+7	+4	+4	+5	+5
[T][S][HP]Async	+6	+3	+3	+4	+4	+6	+6	+7	+3	+5	+5	+6
[T][S][L]	-0	-4	-2	-1	-2	-0	+2	+0	-4	-0	-2	-0
[T][S][L]Cache	+6	+3	+4	+4	+4	+7	+8	+6	+2	+5	+4	+6
[T][S]Sparse	+10	+12	+7	+9	+13	+10	+11	+12	+10	+10	+12	+10
step_sgd	-6	-3	-7	-6	-3	-3	-6	-4	-4	-6	-2	-6
step_tween	-7	-4	-7	-8	-4	-7	-5	-5	-5	-6	-3	-7
step_tween_chain	-7	-3	-8	-7	-2	-7	-3	-3	-3	-5	-2	-5
tween	-2	-1	-5	-3	-1	-5	-2	-2	-2	-3	-0	-0
tween_chain	+1	+0	-5	-1	-0	-2	+1	+1	-2	-2	+1	-2

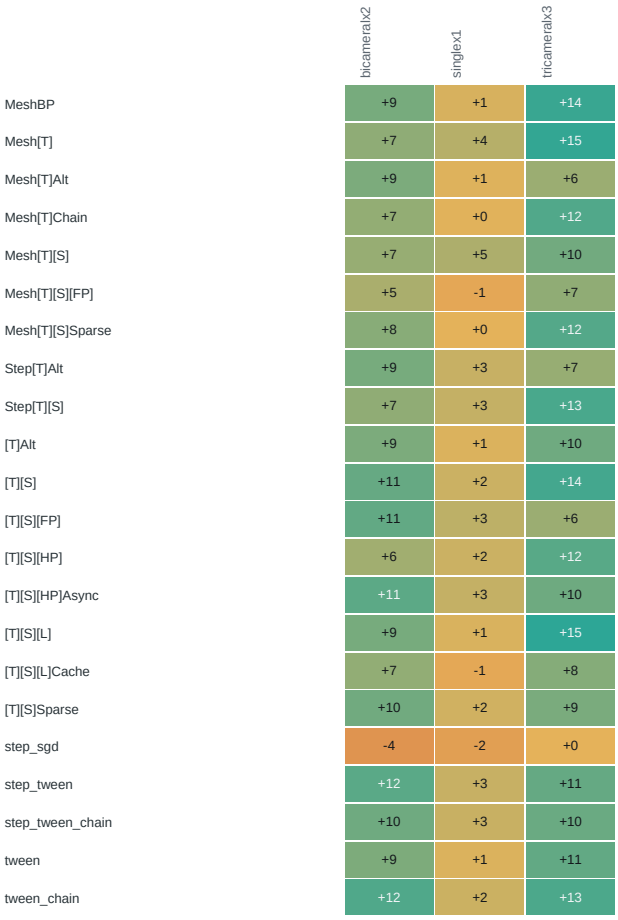
AvailD vs sgd, every mode x dtype (cols 25-34)

AvailD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	-3	-0	-2	-0	+1	+1	-0	-0	-1	-1
Mesh[T]	-3	-2	-5	-4	-2	-2	-3	-3	-1	-2
Mesh[T]Alt	-9	-8	-10	-7	-7	-6	-9	-9	-8	-8
Mesh[T]Chain	-5	-2	-3	-1	+0	+1	-2	-3	-2	-1
Mesh[T][S]	+3	+6	+4	+7	+6	+8	+6	+2	+4	+6
Mesh[T][S][FP]	+4	+4	+3	+5	+6	+8	+7	+5	+4	+6
Mesh[T][S]Sparse	+7	+9	+8	+10	+10	+10	+10	+11	+10	+10
Step[T]Alt	-11	-10	-11	-10	-9	-9	-9	-11	-10	-10
Step[T][S]	-3	-0	-1	-0	-1	+1	+0	-2	-2	-2
[T]Alt	-10	-7	-8	-6	-6	-6	-9	-8	-7	-7
[T][S]	+3	+6	+6	+6	+7	+7	+7	+5	+5	+5
[T][S][FP]	+4	+7	+4	+6	+5	+7	+6	+5	+4	+6
[T][S][HP]	+5	+6	+5	+5	+6	+8	+6	+6	+5	+6
[T][S][HP]Async	+4	+6	+5	+6	+7	+7	+7	+6	+4	+6
[T][S][L]	-4	-0	+0	-0	-0	+2	+0	-1	-3	+1
[T][S][L]Cache	+3	+6	+6	+5	+6	+8	+6	+5	+4	+5
[T][S]Sparse	+7	+9	+9	+10	+8	+10	+10	+9	+10	+10
step_sgd	-8	-5	-7	-4	-4	-5	-5	-5	-4	-5
step_tween	-8	-6	-7	-7	-6	-5	-8	-6	-6	-7
step_tween_chain	-7	-5	-7	-5	-5	-5	-6	-6	-5	-5
tween	-4	-2	-3	-1	-1	-2	-2	-2	-2	-3
tween_chain	-4	+0	-3	-1	+0	+2	-0	-2	-1	-1

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

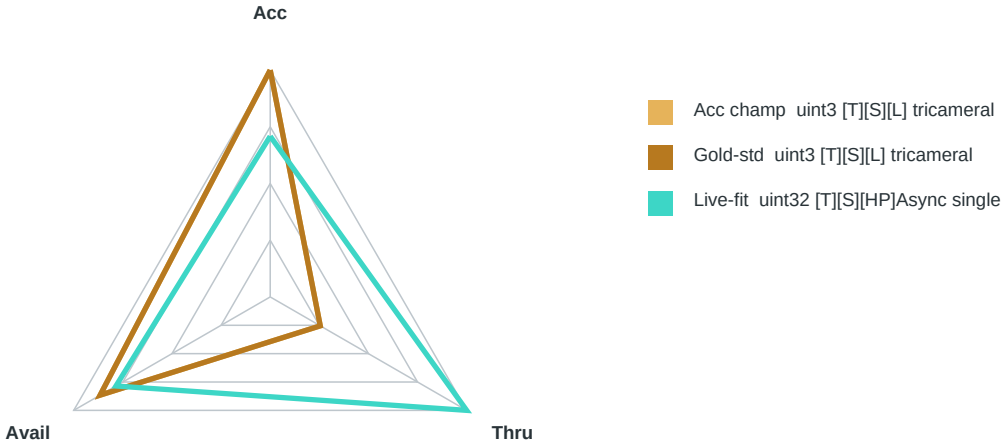
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	102	16.48
Step[T][S]	[T][S]	102	12.64
step_sgd	sgd	102	4.55
step_tween	tween	102	6.91
step_tween_chain	tween_chain	102	6.37

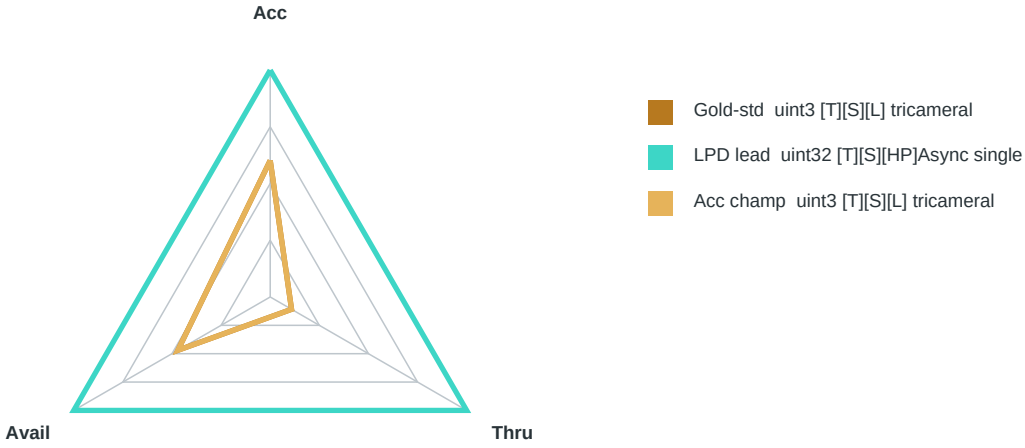
Consciousness - Acc, Throughput, Availability

Synthetic organism / Lucy density: can the net run and train at the same time in a small box. Lucy Score = Throughput x Availability x Acc / 10,000 (hard Acc; SoftAcc is serve-confidence only). SGD that blocks serve dies on Availability. Q = geomean Acc/Thru/Avail vs learner peaks (traps do not set Thru/Avail). LPD = Q x shrink vs Acc-champ RAM; 0 unless Acc keep >=70%. Gold = all 3 pillars >=80% at <=20% Acc-champ RAM. Gold-std = Acc >=80% plus Thru or Avail, then smallest then fastest. Score/MiB is the binary trap.
Acc champ uint3|none|[T][S][L]|tricameral|simd Acc 100.0 Thru 32 Avail 28.5% 6.5 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) uint8|none|sgd|single|simd Score 37.3 Acc 35.0 Soft 24 0.9 KiB
Live-fit champ (best Q) uint32|none|[T][S][HP]Async|single|simd Acc 70.8 Thru 124 Avail 25.8% 2.8 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): uint3|none|[T][S][L]|tricameral|simd mode [T][S][L] Acc 100.0 Thru 32 6.5 KiB
Board fastest float32|none|sgd|single|simd Thru 499 (traps may own this) Best availability nf4|none|[T][S]Sparse|tricameral|simd 40.1%
Learner Thru peak 124 learner Avail peak 32.9%

Consciousness radar - Acc / Thru / Avail vs learner peaks



Memory density radar - same pillars x shrink vs Acc champ (traps sit at origin)



No gold cell yet. Need all three pillars at 80% of learner peaks in one fifth of Acc-champ RAM.

Gold-standard train modes - 2+ pillars, Acc keep >= 80%, smallest then fastest

Mode	n	Acc	KiB	Thru	Cell
[T][S][L]	1	100.0	6.5	32	uint3 [T][S][L] tricameral

Lucy density (LPD) - Q x shrink vs Acc-champ RAM; 0 if Acc keep < 70%

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
-	uint32 [T][S][HP]Async single	71	100	79	82	43	2.3	1.93	70.8	124	2.8
-	uint2 [T][S][L]Cache tricameral	75	40	91	65	68	1.5	0.95	75.0	49	4.5
keep	uint3 [T][S][L] tricameral	100	25	87	60	100	1.0	0.60	100.0	32	6.5
-	uint5 [T]Alt bicameral	75	26	58	48	125	0.8	0.39	75.0	32	8.2
-	uint [T][S][FP] tricameral	75	44	100	69	2040	0.0	0.03	75.0	54	133.3
-	int4 Mesh[T][S]Sparse tricameral	62	89	100	82	131	0.8	0.00	62.5	110	8.6
-	uint16 [T][S][FP] single	62	100	80	79	23	4.3	0.00	62.5	162	1.5
-	float16 [T][S]Sparse single	59	99	78	77	23	4.4	0.00	59.4	122	1.5
-	int2 Mesh[T][S]Sparse bicameral	50	90	97	76	52	1.9	0.00	50.0	111	3.4
-	fp8e5m2 [T][S]Sparse bicameral	69	64	100	76	197	0.5	0.00	68.8	79	12.9

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	fp8e5m2 [T][S]Sparse single	62	92	76	76	13	7.5	0.00	62.5	113	0.9
-	binary [T][S]Sparse tricameral	42	100	100	75	36	2.8	0.00	41.7	151	2.3
trap	fp8e4m3 [T][S][L]Cache single	56	100	72	74	13	7.5	0.00	56.2	151	0.9
-	bfloat16 [T][S][HP] bicameral	44	100	89	73	390	0.3	0.00	43.8	132	25.5
-	complex128 [T][S][HP] single	50	100	77	73	157	0.6	0.00	50.0	166	10.2
-	fp8e5m2 [T][S][HP] tricameral	62	66	91	72	258	0.4	0.00	62.5	82	16.9
-	uint16 [T][S][L]Cache single	50	100	74	72	23	4.3	0.00	50.0	129	1.5
-	uint [T][S] tricameral	38	98	97	71	2040	0.0	0.00	37.5	121	133.3
trap	uint5 [T][S][HP] single	50	93	76	71	10	9.7	0.00	50.0	115	0.7
-	fp8e4m3 [T][S][HP] bicameral	44	89	91	71	197	0.5	0.00	43.8	110	12.9

Consciousness rank - Q = geomean Acc/Thru/Avail keep

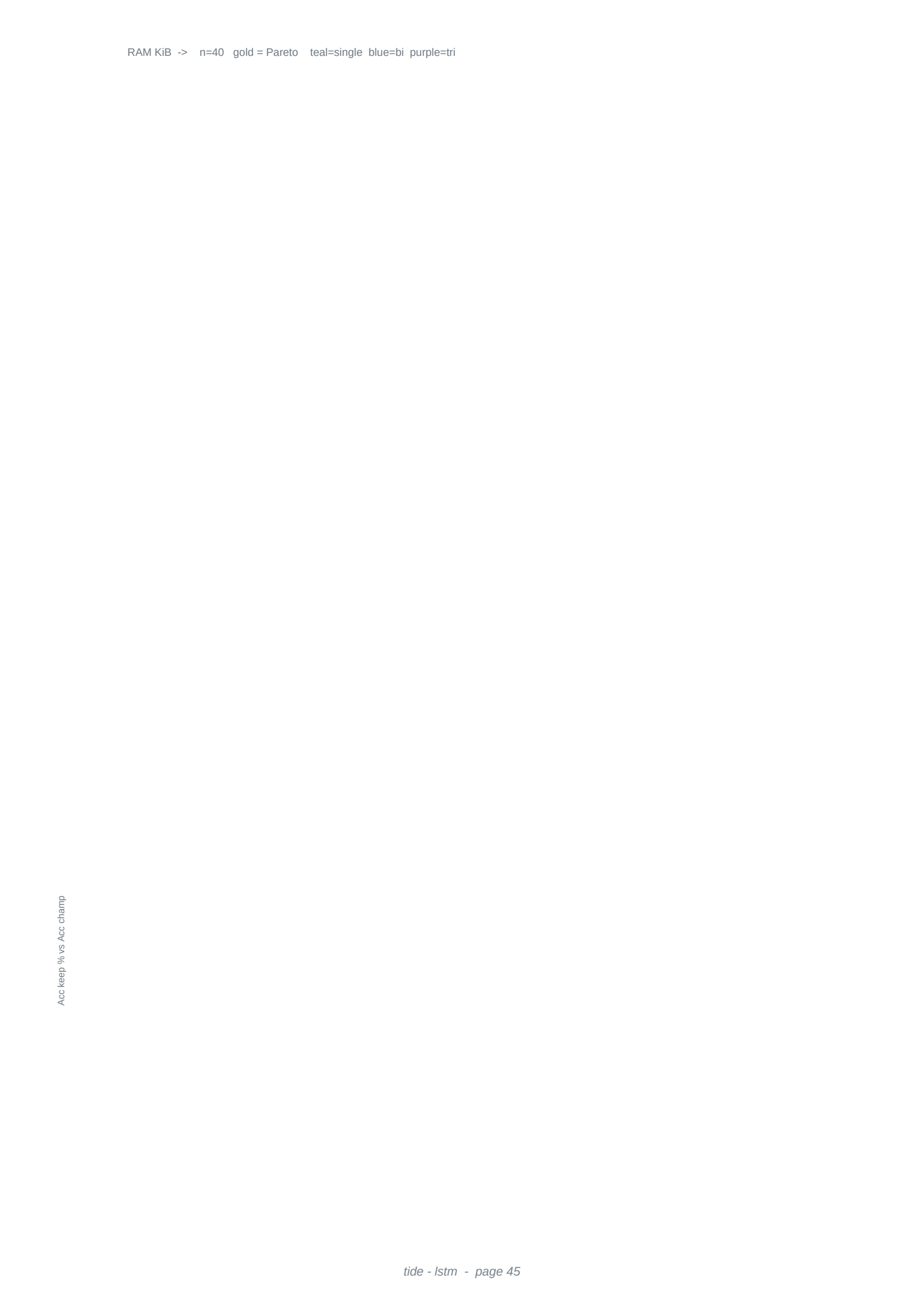
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
-	uint32 [T][S][HP]Async single	71	100	79	82	1.93	124	25.8
-	uint [T][S][FP] tricameral	75	44	100	69	0.03	54	32.9
-	uint2 [T][S][L]Cache tricameral	75	40	91	65	0.95	49	30.0
keep	uint3 [T][S][L] tricameral	100	25	87	60	0.60	32	28.5
-	uint5 [T]Alt bicameral	75	26	58	48	0.39	32	19.0
-	int4 Mesh[T][S]Sparse tricameral	62	89	100	82	0.00	110	33.4
-	uint16 [T][S][FP] single	62	100	80	79	0.00	162	26.4
-	float16 [T][S]Sparse single	59	99	78	77	0.00	122	25.7
-	int2 Mesh[T][S]Sparse bicameral	50	90	97	76	0.00	111	32.0
-	fp8e5m2 [T][S]Sparse bicameral	69	64	100	76	0.00	79	36.5

Trap - tiny RAM, Acc keep < 70% (Score/MiB and SoftAcc Score lie here)

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	binary sgd single	18	100	62	48	5	19.9	0.00	18.0	461	0.3
trap	binary step_sgd single	19	100	50	46	5	19.9	0.00	19.2	336	0.3
trap	binary tween single	17	100	58	46	5	19.9	0.00	17.0	362	0.3
trap	binary tween_chain single	26	100	71	57	5	19.9	0.00	25.6	383	0.3
trap	binary step_tween single	30	100	47	52	5	19.9	0.00	29.9	266	0.3
trap	binary step_tween_chain single	23	100	53	49	5	19.9	0.00	22.8	326	0.3
trap	binary MeshBP single	19	100	61	48	5	19.9	0.00	18.7	364	0.3
trap	binary Mesh[T] single	20	100	56	48	5	19.9	0.00	19.5	320	0.3
trap	binary Mesh[T]Chain single	17	100	60	47	5	19.9	0.00	16.8	330	0.3
trap	binary [T][S] single	23	100	75	56	5	19.9	0.00	22.8	327	0.3

Acc keep % vs RAM KiB (gold = high Acc, low RAM vs Acc champ)



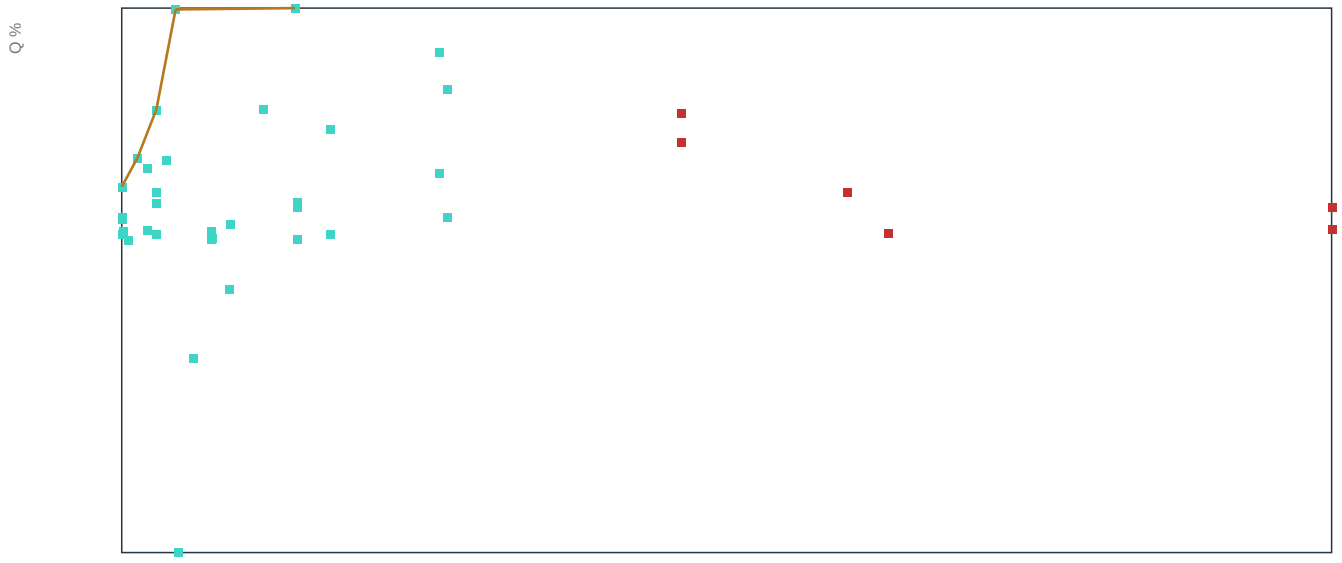

RAM KiB -> n=40 gold = Pareto teal=single blue=bi purple=tri
Acc keep % vs Acc champ

Q% vs RAM KiB (gold = high consciousness, low RAM)



RAM KiB -> n=40 gold = Pareto teal=single blue=bi purple=tri

Q% vs shrink vs Acc champ (gold = upper right)

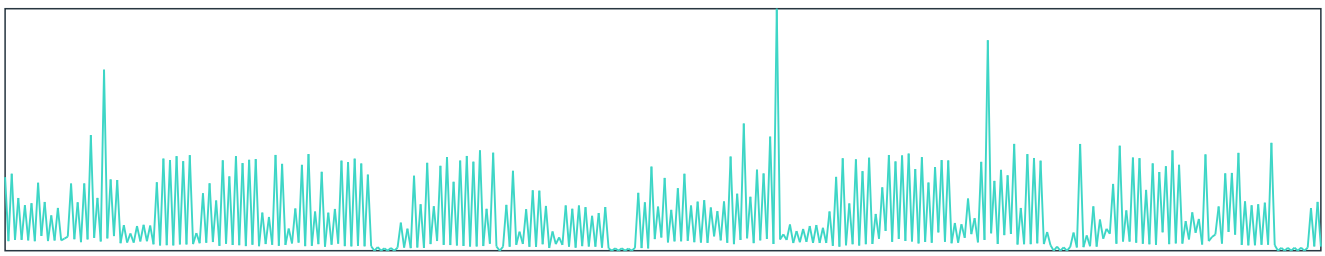


times smaller than Acc champ -> n=40 gold = Pareto teal=single blue=bi purple=tri

Top Lucy density (LPD)

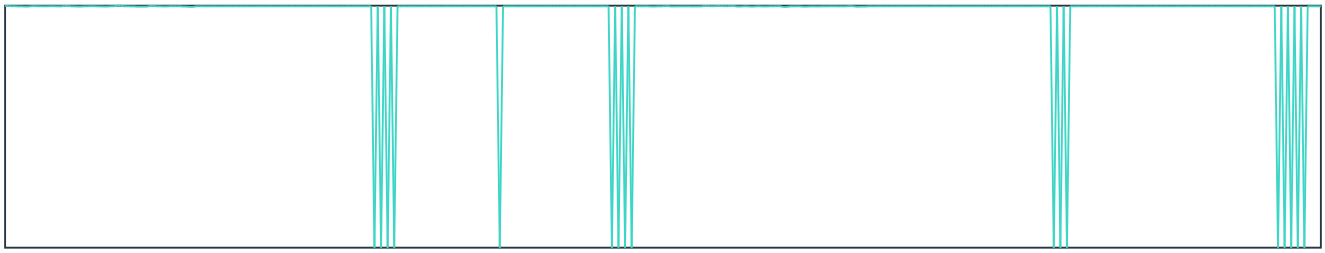


Live pulse (Score)



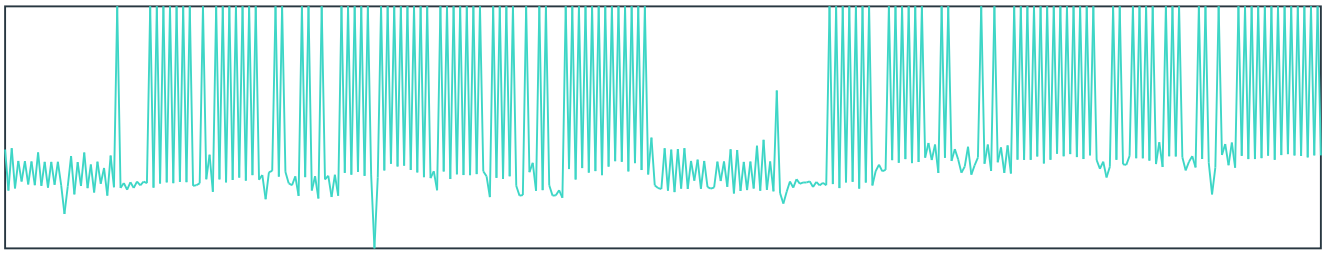
n=400 min=0.00 max=123.83

Live pulse (SoftAcc)



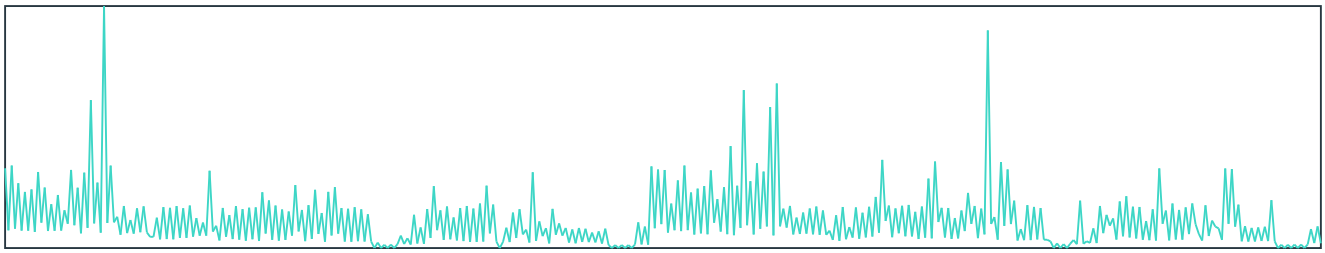
n=400 min=0.00 max=25.07

Live pulse (Availability)



n=400 min=0.00 max=100.00

Live pulse (Throughput)



n=400 min=0.00 max=1116.34

Queue by train mode (this epoch)

Mode	Done	Run	Left	Total